

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The REVIEW for November, 1894, is based on reports from 3,223 stations occupied by regular and voluntary observers. These reports are classified as follows: 149 reports from Weather Bureau stations; 36 reports from U. S. Army post surgeons; 2,241 monthly reports from State Weather Service and voluntary observers; 32 reports from Canadian stations; 219 reports through the Southern Pacific Railway Company; 502 marine reports through the cooperation of the Hydrographic Office, Navy Department, and "New York Herald Weather Service;" monthly reports from 37 U. S.

Life-Saving stations; 39 reports from navigators on the Great Lakes; monthly reports from local services established in all States and Territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by the Division of Records and Meteorological Data, in charge of Mr. A. J. Henry, acting chief of that division.

CHARACTERISTICS OF THE WEATHER FOR NOVEMBER, 1894.

The most prominent features of the month of November were the sudden development of the storm of the 5th on the coast of New Jersey; the severe storms of the 2d, 9th, 10th, 11th, and 26th in the Lake region; the general deficiency of precipitation in the middle and southern portions of the United States; and the excess of temperature from the Pacific coast eastward to the one hundredth meridian. The prevailing

characteristic of the month was the persistent motion of high areas and the formation of ridges of high pressure from Oregon southeastward to the Gulf and south Atlantic States with a small depression on the southwest side of this ridge and numerous depressions on its northeast side, from which there resulted an average distribution of pressure as shown on Chart II, characterized by a distinct ridge of high pressure from Oregon, Nevada, and Idaho southeast to Georgia.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers not reduced to standard gravity and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), during November, 1894, is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border. This Chart also gives the so-called resultant wind directions for this month, based on the data given in Table IX of this REVIEW.

During the current month of November the highest mean pressures have been: 30.29, Salt Lake City; 30.26, Idaho Falls, Winnemucca, and Carson City; 30.25, Atlanta, Montgomery, and Mobile; 30.24, Charleston, Meridian, and El Paso. Lowest mean pressures: 29.89, Sydney, N. S.; 29.91, Father Point, Que.; 29.93, St. Johns, N. F.; 29.95, Halifax, N. S., and Eastport.

The normal distribution of atmospheric pressure and normal resultant wind direction for the month of November were approximately shown on Chart V of the REVIEW for November, 1893, as computed by Prof. H. A. Hazen, and are not now reproduced. As compared with the normal for

November, the mean pressure for the current month was deficient in Nova Scotia, Quebec, Maine, northern New York, and nearly the whole of Canada, and in excess over the whole of the rest of the country. The maximum excesses were: 0.12, Tatoosh Island and Port Angeles; 0.11, Mobile; 0.10, New Orleans, Galveston, and Jacksonville.

As compared with the preceding month of October, the pressures, reduced to sea level, show a maximum rise of 0.25 at Huron, Moorhead, and Sioux City, 0.24 at St. Paul, Omaha, and Concordia, and a maximum fall of 0.09 at Sydney, N. S., 0.06 at Charlottetown, P. E. I., and 0.05 at Chatham, N. B.

DIURNAL VARIATIONS.

The systematic periodic diurnal variations of pressure are shown by the hourly means given in Table VI.

AREAS OF HIGH AND LOW PRESSURE.

The following sections give some details as to the phenomena attending the individual areas of high and low pressure. Hitherto it has been customary to enumerate the storm wind signals in connection with special areas of low pressure. During the summer months high winds occur in connection with areas of low pressure, or so-called storm centers, but during

the winter season the northwesterly gales are by reason of their coldness associated with the areas of high pressure. In general, it is proper to consider a strong wind in connection with steep barometric gradients and to postpone any decision as to whether the low pressure on one side, or the high pressure on the other is especially responsible for the gradient or the wind. As the ordering of wind signals oftentimes depends quite as much on the approach of a high area as of a low the Editor will, for the present, publish these signal orders in connection with the chapter on "High winds," where the connection between the high and low areas will also be mentioned when necessary.

MOVEMENTS OF CENTERS.

The following table shows the date and location of the center at the beginning and ending of each area of high or low pressure that has appeared on the U. S. Weather Maps during the month, together with the average daily and hourly velocities. The monthly averages will differ according as we consider each path as a distinct unit, or give equal weight to each day of observation; in the first case the monthly average is taken by paths, in the latter case by days.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.	1, a. m.	34	82	3, a. m.	43	60	1,500	3-0	500	20.8
II.	1, a. m.	41	117	3, a. m.	30	102	1,200	3-0	400	16.7
III.	2, p. m.	45	123	7, a. m.	32	80	3,600	4-5	800	33.3
IV.	3, p. m.	43	112	9, a. m.	31	98	2,200	3-5	620	26.2
V.	7, a. m.	54	115	10, a. m.	50	60	2,800	3-0	933	38.9
VI.	8, p. m.	53	111	13, a. m.	36	71	3,250	4-5	722	30.1
VII.	10, p. m.	45	114	15, p. m.	33	78	5,100	5-0	1,020	41.7
VIII.	15, a. m.	54	117	18, p. m.	47	60	4,400	3-5	1,257	52.4
IX.	17, a. m.	55	110	20, p. m.	42	70	3,200	3-5	914	38.1
IX a.	20, p. m.	42	70	21, p. m.	46	57	800	1-0	800	33.3
IX b.	20, p. m.	42	70	22, a. m.	36	70	1,200	1-5	800	33.3
X.	17, p. m.	44	125	19, a. m.	38	107	1,100	1-5	933	40.5
XI.	19, p. m.	46	125	25, a. m.	33	90	3,000	5-5	544	22.7
XII.	20, a. m.	50	110	22, a. m.	39	76	2,100	3-0	1,050	43.5
XIII.	21, p. m.	53	97	27, p. m.	30	80	2,300	3-0	767	31.5
XIV.	26, a. m.	55	115	30, p. m.	46	64	2,700	4-5	600	25.0
XV.	27, p. m.	34	121	29, a. m.	40	116	800	1-5	533	22.2
Sum.							41,250	54-0	1,202	.....
Mean of 17 paths.									718	29.9
Mean of 54 days.									764	31.8
Low areas.										
I.	1, a. m.	49	68	1, p. m.	51	64	150	0-5	.....	.....
II.	1, a. m.	35	100	4, a. m.	51	60	3,350	3-0	763	31.8
II a.	1, p. m.	33	97	3, a. m.	46	78	1,350	1-5	900	37.8
III.										
IV.	2, a. m.	53	117	4, a. m.	44	86	1,600	2-0	800	33.3
V.	4, p. m.	55	123	6, p. m.	51	100	1,100	2-0	550	22.9
VI.	5, a. m.	39	75	7, a. m.	50	56	1,300	2-0	650	27.0
VII.	8, p. m.	41	97	8, p. m.	39	70	1,500	2-0	750	31.3
VIII.	7, p. m.	55	112	11, p. m.	56	63	2,800	4-0	700	29.8
IX.	10, a. m.	55	119	15, a. m.	48	53	2,900	5-0	580	24.2
X.	13, p. m.	55	115	17, a. m.	54	55	2,750	3-5	786	32.8
X a.	14, a. m.	44	105	16, p. m.	37	83	2,100	2-5	840	30.8
XI.	16, p. m.	52	114	20, a. m.	48	55	3,050	3-5	871	36.3
XII.	19, a. m.	52	116	21, p. m.	51	69	2,400	2-5	960	40.0
XIII.	20, p. m.	53	112	26, a. m.	46	55	3,000	5-5	550	22.9
XIII a.	21, p. m.	39	104	24, a. m.	53	55	2,600	2-5	104	4.3
XIV.	23, p. m.	51	130	28, a. m.	50	59	3,600	4-5	800	33.3
XV.	26, a. m.	43	125	29, a. m.	52	98	1,650	3-0	550	22.9
Sum.							36,200	49-5	11,154	.....
Mean of 17 paths.									657	27.4
Mean of 49.5 days.									731	30.5

HIGH AREAS.

I.—This area was a continuation of No. XI of October, and was central on the 1st, a. m., in the south Atlantic States, after which it moved eastward and continued for several days as a portion of the general high pressure over the Atlantic Ocean.

II.—This was central on the 1st, a. m., in Nevada, after which it extended southeastward as an indefinite area, or ridge, over the Gulf States.

III.—This was central on the 2d, p. m., on the coast of Oregon, and after moving northeast into Alberta stretched rapidly southeast and disappeared on the 7th, a. m., off the south Atlantic coast. Severe frosts preceded the center of high pressure as it moved eastward on the 6th over the Gulf and south Atlantic States.

IV and V.—No. IV was central on the 5th, p. m., in southern Idaho, as a subsidiary portion of the preceding area from which it was separated by a slight depression. Pressure remained high over the Rocky Mountain plateau for two days, and an additional ridge of high pressure, No. V, descended southeastward from the British Possessions. Nos. IV and V united on the 7th, after which the high pressure continued moving southward. But this combined area also seems to have sent a portion more directly eastward, which was central on the 8th, p. m., north of Lake Superior, and disappeared on the 10th, a. m., over Newfoundland; to this portion the No. V is applied. Areas Nos. IV and V can therefore be considered as two independent waves crossing each other on the 7th, p. m., and subsequently pursuing different paths as they had done before.

VI.—On the 8th, a. m., while low No. VIII was central in Alberta pressure rose rapidly in British Columbia and high area No. VI developed rapidly in that region. At 8 p. m. it was central in Alberta, stretching southward as a ridge to high No. IV in Texas. After moving slowly southeast to Manitoba it moved rapidly south on the 10th and by the 12th, a. m., was central in Alabama. It disappeared on the 13th off the middle Atlantic coast.

VII.—This area developed over the Rocky Mountain plateau region on the 10th and was apparently a western prolongation of high No. VI. Pressure continued high until the 13th, p. m., from British Columbia southeastward to Texas, and the location of the centre of No. VII went through numerous oscillations between Utah and British Columbia, until finally, on the 14th, a. m., it was central in Texas, at which time the ridge of highest pressure was very narrow and stretched from Texas northwest to Oregon and also eastward to Georgia. It was at this time undoubtedly prolonged in these two directions far beyond the limits of our maps, forming the boundary of one of those great areas of low pressure within which several special low centres and cyclonic whirls occur.

It is proper here to call renewed attention to the mechanism of high and low areas. Two convenient words were suggested in 1870 by Prestel, viz, "pleiobar" and "meiobar." Isobars for high pressure, viz, those above 30 inches, are called pleiobars, and isobars for low pressures, or below 30 inches, are called meiobars. Regions of high or low pressure are therefore respectively pleiobaric and meiobaric areas, but for brevity we will also call them simply pleiobars and meiobars. We will furthermore not apply these words to small areas of high and low pressures, but only to the very largest areas, within which it often happens that there are several smaller highs and lows. Thus, on the 13th, a. m., a meiobar or general area of low pressure extended from northern Europe westward over the North Atlantic and Labrador into our Lake region, within which three or more regions of low pressure can be distinguished; at the same time a region of high pressure, or pleiobar, prevailed from Persia westward over Asia Minor and northern Africa, the mid-Atlantic Ocean, our Atlantic and Gulf States, and Rocky mountain plateau region, within which belt four centres of high pressure can be distinguished.

It is the underflow of air from the greater pleiobars into the extensive meiobars that is the prominent feature of what is called the general movement or general circulation of the atmosphere, and this flow is controlled by the rapid diurnal rotation of our globe. The individual smaller areas of high and low pressure that accompany these larger move-

ments are initiated by the character of the earth's surface as to topography, temperature, and moisture. That is to say, the pleiobar is irregularly fed and built up in patches of "high;" the meiobar is irregularly broken up and subdivided into areas of "low." From a chartographic and descriptive point of view, the areas of high and low pressure, whose paths are described monthly in this REVIEW, represent the breaking up of the greater pleiobars and meiobars into fragments, a process that is continually going on. The reconstruction of these greater areas of high and low pressure is also continually going on, but in the upper region of the atmosphere where we have as yet but few observations and unsatisfactory theories to guide our thoughts. From a dynamic point of view the smaller highs and lows represent a new distribution of energy, a dissipation of the energy that was originally massed in the general circulation of the atmosphere, or potentially concealed in the pleiobars and meiobars. The sum total of all this energy, kinetic, potential, and thermal, is of course equal to that received from the sun.

VIII.—On the 15th, a. m., pressure rose rapidly in British Columbia, Alberta, Washington, and Oregon, as an extensive area of high pressure pressed eastward on the Pacific coast toward the great meiobar, whose western end was marked by low pressure No. X, then central in Manitoba. On the morning of the 15th frost occurred in western Oregon and generally in Washington. On the morning of the 16th a still more severe frost occurred throughout the Pacific States and plateau region, at which time highest pressure was central in Wyoming, but without having diminished in Oregon and Washington. This southeast movement is in intimate connection with the development of low pressure in southern California; on the 15th, p. m., pressure at Yuma reached its lowest point for the month. In general, the presence of high pressure on the plateau region and low pressure in southern California produces northeast winds, clear weather, low temperatures, and very dry air in the eastern half of California. These cold, dry, northeast winds are considered injurious to vegetation, as they produce a greater evaporation from the plants than the roots are able to supply. By the 17th, a. m., this area was central in western Texas, after which the ridge of high pressure extended from Texas northeast to Nova Scotia, and northwest to Oregon, approximately repeating the conditions prevailing on the 13th, a. m. After the 17th, a. m., and apparently by virtue of some additional movement of the air southward over Labrador, the northeastern arm of this ridge merged into the area of high pressure that was central over Newfoundland on the 18th, p. m.

IX.—On the 17th, a. m., pressure began to rise in Alberta on the north side of low No. XI. This high area moved rapidly southeastward, reaching Iowa on the 19th, a. m., and thence eastward, becoming central on the 20th, a. m., in New Jersey, and 20th, p. m., at Cape Cod. By the 21st, a. m., this area seems to have extended from Cape Breton to North Carolina, while pressure over the adjoining part of the Atlantic Ocean was quite high; by the 22d, a. m., while a portion of this area (IXa) had disappeared over the Atlantic, another portion (IXb) must be considered as having merged with high area No. XII.

X.—On the 17th, p. m., pressure began rising in Oregon and Utah, and during the 18th a ridge prevailed trending southeast over the plateau region. By the 19th, a. m., this had disappeared as a well-marked high area in the presence of the following area and ridge that had formed a little way farther north.

XI.—On the 19th, a. m., pressure rose rapidly in Oregon and Washington in the rear of low No. XII, and remained high in this region until the 22d, a. m., by which time the central highest pressure was in Idaho, and by the 23d, a. m., in Oklahoma, after which it remained nearly stationary until it disappeared on the 25th, a. m., in western Texas.

XII.—On the 20th, a. m., pressure rose in Assiniboia between lows Nos. XII and XIII. This moved rapidly southeastward, and by the 21st, p. m., had reached South Carolina and joined the southern portion of high No. IX, after which it disappeared off the Atlantic coast.

XIII.—On the 24th, p. m., pressure rose in Manitoba in the rear of low No. XIII, and prevailed as a part of a pleiobar covering the region between the Gulf of Mexico and Hudson Bay, within which several minor elevations appeared. The principal center of high pressure moved eastward, reaching the Ottawa River on the 25th, p. m. It then shifted suddenly southward into Virginia, and disappeared on the 27th, p. m., off the coast of Florida.

XIV.—On the 26th, a. m., pressure began to rise in Alberta, and apparently also in British Columbia. By the 26th, p. m., the highest pressure was central in western Assiniboia, while low No. XV was off the coast of Washington and Oregon. The center of this high area moved eastward over Manitoba, and southeastward through Ottawa, disappearing on the 30th in Nova Scotia, but its cold, northerly winds were felt as far south as Florida and the Gulf of Mexico. From the 26th to the 30th, the pressure at Key West rose 0.06 inch, and the temperature remained entirely unchanged with northeast winds and clear weather, except a light rain on the 30th; from this point to the St. Lawrence Valley the country was under the influence of high area No. XIV, and the more so with increasing latitude.

XV.—On the 27th, in the rear of low No. XV, pressure rose in California with southerly winds, the temperature remained stationary, and frosts prevailed on the morning of the 28th. High area No. XV moved northward into Idaho, where it disappeared on the 29th, which was, of course, merely a surging, as it were, of the high pressure or pleiobar located on the Pacific Ocean to the southwest of California.

LOW AREAS.

I.—This was a continuation of low No. XVIII of the series for October. It was central on the 1st, a. m., north of the St. Lawrence, and disappeared on the 2d, a. m., north of Newfoundland.

II.—This was central on the 1st, a. m., in northern Texas, but by the 1st, p. m., two centers had developed within an oval region, and these continued moving side by side until they again joined on the 3d, a. m., in the valley of the Ottawa River and disappeared finally on the 4th, a. m., in Labrador. High winds and gales in the Lake region and on the New England coast on the 3d accompanied this area.

III.—This number is given to the low pressure extending up the Gulf of California. The principal minima of the month at Yuma occurred on the 3d, p. m., 29.96; 7th, p. m., 29.91; 15th, p. m., 29.78; 21st, p. m., 29.84; 28th, p. m., 29.96. As has been remarked in previous MONTHLY REVIEWS, the trough of low pressure, which extends from Yuma southward and which on the preceding dates had a special extension northward, has some general connection with the appearance of low pressures in British Columbia and Alberta. Occasionally a trough extends northward over Arizona into British America, while at other times the trough evidently extends rather rapidly from British America southward to Arizona and the Gulf of California. The principal depression of the present month occurred on the 15th, p. m., at which time low area No. X was central near the southern end of James Bay and low No. Xa was central in Indian Territory. These two low areas, together with No. III in Arizona, at that time constituted a portion of the great meiobaric area reaching from the Baltic Sea west-southwest over the Atlantic, Labrador, the United States, and undoubtedly still farther southwest into the Pacific Ocean. Such meiobars, and therefore to a certain extent, the special low which we call No. III, and which frequently appears on

our maps as extending from Arizona southward, represent broad features of the general atmospheric circulation. Their origin must not be sought in what are called local conditions, but in the general conditions, such as those which form the great areas of high pressure on the Atlantic and Pacific oceans; that is to say, the same causes that operate to produce the Atlantic and Pacific pleiobars also produce the meibars that lie between them.

IV.—On the 1st, p. m., pressure fell in British Columbia, and a low area was undoubtedly central in the northern portion of that region; by the 2d, a. m., this center may be located in Alberta; it moved southeastward and disappeared on the 4th, a. m., in the Lake region by combination with low No. II.

V.—This appeared on the 4th, p. m., in British Columbia, and on the 5th, a. m., was central near Edmonton; it moved slowly eastward and disappeared on the 6th, p. m., in Manitoba.

VI.—This appeared on the 5th, a. m., off the coast of New Jersey, where it seems to have originated; it rapidly developed into a very severe storm, which was central on the 5th, p. m., at the eastern end of Long Island. The sudden development of this storm seems to have been brought about by the flow southward of an upper current of cold air, causing rain over the Middle States but snow over New York and New England. The storm moved northeast over the Gulf of Newfoundland on the 6th.

VII.—On the 6th, p. m., pressure was lowest in Manitoba, where area No. V seems to have closed up, but at the same time a slight depression, No. VII, originated in eastern Nebraska, which was at first merely marked by a cyclonic system of winds; these were, however, high, cold, southerly winds on the eastern side from Omaha to St. Vincent, and relatively warm northerly winds from North Platte northward to Bismarck. These conditions evidently show that there was on the west a system of descending and warming winds, but on the east a system of ascending and cooling winds. From this combination, low No. VII developed and moved eastward until, on the 8th, p. m., it was central off the middle Atlantic coast, after which it disappeared.

VIII.—On the 7th, p. m., pressure was falling in Alberta, and on the 8th, a. m., low No. VIII was central in Saskatchewan. The central pressure fell decidedly, while this low area moved southeastward into the Lake region, where it was central on the 9th, p. m., as a severe storm of wind and snow; it then moved northeastward, and disappeared on the 11th, p. m., in Labrador. It apparently crossed the Atlantic, reaching the North Sea by the 14th.

IX.—On the 10th, a. m., low pressure was central north of Alberta. It moved slowly southeastward, reaching Lake Superior on the 12th, p. m., and thence eastward, leaving the coast of Newfoundland on the 15th, a. m.

X and Xa.—On the 13th, p. m., an area of low pressure very suddenly appeared in Alberta, and the descending southerly winds from high area No. VII, which then covered the plateau region, brought high temperatures and föehn winds to western Montana. The chinook began at Havre on the 13th at 11 p. m., when temperature rose from 25° to 55° in an hour, and continued between 55° and 62° until 6.30 p. m. of the 14th, when it was suddenly followed by cold, northerly winds. At Helena the chinook lasted from 9 a. m. of the 14th to 3 a. m. of the 15th, when it also was followed by cold, northerly winds. The area covered by the chinook winds at any time is sharply bounded on the northwest side by cold, northerly winds, and as these fill up the lowlands and prevent the descent of the southerly winds the latter are forced to flow more nearly horizontally overhead and lose their chinook character. In general, so far as concerns orography, the south and west winds that blow from the Rocky Mountain region into the area of

low pressure in the midst of the valley and Lake region have a certain amount of descending motion until they are forced up by the underflow of the colder northwest winds. The map of the 15th, p. m., shows that, between the high pressure on the south Atlantic coast and that of British Columbia, there was a broad belt of low pressure extending from the Appalachians to Alberta and from the Rocky Mountains northeast to Labrador. Southwest winds of from 30 to 50 miles prevailed over the Lake region and northwest winds on the eastern Rocky Mountain slope. A trough of low pressure was thus formed, extending from Texas to Labrador, and while area No. X moved eastward into the latter region, a subsidiary area, No. Xa, began to develop on the 14th, a. m., between northerly and southerly winds in Dakota and Wyoming. This area, by a frequent renewal rather than by continuous existence, may be traced through the 14th and 15th until it disappeared on the 16th, p. m., in Kentucky.

XI.—On the 16th, p. m., a low area was central in Alberta, which moved southeastward until, on the 17th, a. m., it was central in North and South Dakota; it then moved eastward, followed by snow over the Lake region, and disappeared on the 20th, a. m., over Newfoundland. High northwest winds prevailed in its rear over New England.

XII.—On the 19th, a. m., low No. XII was central in Alberta, while high No. XI was approaching Oregon from the west. As the low center moved southeast, reaching Athabasca by the 19th, p. m., and the high area advanced eastward into Oregon, the general flow of descending air brought chinook winds to western Montana, southern Idaho, Wyoming, and Colorado. On the 19th, a. m., at Helena, southeast winds, temperature 36, prevailed, while at Havre, 100 miles distant, light northeast winds, temperature 10, prevailed; this northeast wind continued until 4 p. m., when the temperature was 26, but the clouds were moving rapidly from the west; at 4.20 the chinook began at Havre, and at 4.40 the temperature was 50 and the wind west, 36 miles per hour; at 8 p. m., Havre, southwest winds, 32 miles, temperature 44, prevailed, while at Helena, west wind, 30 miles per hour, and temperature 44, prevailed. The lowest pressure moved southeastward, reaching Lake Superior on the 20th, p. m., after which it turned northeast and disappeared at the mouth of the St. Lawrence on the 21st, p. m.

XIII.—On the 20th, p. m., pressure was again low in Alberta; this developed as a slight depression, stretching southward into Indian Territory. Pressure remained low in Assiniboia until the 23d, a. m., after which this area moved southeastward over New England, reaching the east Atlantic coast on the 25th, a. m., where it developed into a severe storm and turned northeastward, passing Newfoundland on the 26th.

XIIIa.—This was the southern offshoot of the preceding area, and was located in Colorado on the 21st, p. m. It may be considered as having moved northeastward, reaching the Lake region on the 23d, and disappearing beyond Labrador on the 24th, a. m.

XIV.—On the 23d, p. m., an area of low pressure was apparently west of British Columbia, and after moving southwestward, finally covered that State on the 25th, a. m., and was central in Saskatchewan on the 25th, p. m. This moved southeast, reaching the St. Lawrence Valley on the 27th, producing high southwest and northwest winds and gales on the 26th and 27th in the Lake region, and on the 28th in New England. It disappeared on the 28th, p. m., in Newfoundland.

XV.—On the 26th, a. m., low pressure was evidently central west of Oregon, and after moving slowly northwestward was, on the 28th, a. m., central near Vancouver Island; it rapidly crossed the Rocky Mountain Divide, and on the 29th, a. m., was central in Manitoba, after which it probably broke up and disappeared, as no further traces of its existence appear at our northern stations.

NORTH ATLANTIC METEOROLOGY.

[Pressure in inches and millimeters; wind-force by Beaufort scale.]

NORMAL CONDITIONS.

The normal barometric pressure for November over the North Atlantic Ocean, as deduced from international simultaneous meteorological observations taken at Greenwich noon and not reduced to standard gravity, is lowest, 29.60 (752), in a small oval covering Iceland and North Cape. A similar oval of 29.60 (752) covers the North Pacific from the southern portion of Alaska westward to Kamchatka, between N. 50° and N. 60°. The area of highest pressure, 30.10 (764) to 30.20 (767), extends from California eastward in a narrow belt over the south Atlantic States and the middle Atlantic Ocean to Morocco and Algeria; still higher pressures prevail farther eastward, rising to a maximum of 30.40 to 30.50 in southern Siberia. During November and December, and January and February, the maxima in Siberia and the minima over the North Atlantic and North Pacific are the prominent features in the meteorology of the Northern Hemisphere.

As compared with October, the mean pressures in November are higher by 0.05 to 0.10 over the entire United States, as also over British North America, the North Pacific, and the arctic regions. The maximum rise of pressure is 0.30 in central Asia. Over the North Atlantic pressure is lower by 0.05 or less.

The general path of storm centers in November is appreciably the same as in October and September, the principal change being an increase in the number and frequency of low areas in northern latitudes. The general velocity of movement of storm centers over the United States increases from about 25 miles per hour in the summer months to 37 in the winter months and is 31 miles in November.

NORTH ATLANTIC STORMS.

The following paragraphs give some account of the areas of low pressure and strong winds on the North Atlantic Ocean during November, 1894. Daily charts are compiled at the Weather Bureau showing the atmospheric conditions over the United States, Europe, and the Atlantic Ocean, as nearly as practicable at Greenwich noon, and afford a basis for approximating the locations and paths of the more important areas of high and low pressure.

The individual low pressures are enumerated as follows:

A. This was a continuation of *I* from the series for October and was central off the coast of Ireland on the 1st. It moved northeastward and disappeared on the 2d.

B. This was central on the 1st at N. 52°, W. 49°, and on the 2d, at N. 53°, W. 23°. After this the central pressure fell rapidly, with increasing northwest winds. On the 3d it was at N. 56°, W. 17°. It then passed northeastward over the Orkneys and disappeared on the 5th over the Baltic.

C. This was a continuation of No. II of the United States series, which was central near Labrador on the 4th; at N. 52°, W. 39°, on the 5th; at N. 56°, W. 27°, on the 6th. On the 7th, noon, it was north of Ireland, at N. 60°, W. 10°. Here it merged into the general low of the North Atlantic Ocean.

D. This was a continuation of No. VI of the United States series which developed suddenly on the 5th, and passed slowly northeastward along the southern coast of New England; it was central on the 7th in the Straits of Belle Isle; on the 8th, N. 54°, W. 48°; on the 9th, N. 60°, W. 20°; on the 10th, N. 63°, W. 5°, after which it disappeared from our maps by enlarging and merging into the following.

E. This was apparently central at about N. 45°, W. 20°, on the 10th, moving northward; on the 11th, N. 48°, W. 20°; on the 12th, N. 50°, W. 8°. By the 13th the areas *D* and *E* had

united and were central over Denmark. By the 14th a new depression had formed to the westward and these had moved to the Gulf of Finland, after which they disappeared.

F. On the 12th the pressure was falling west of Great Britain and south of Greenland. Apparently the low pressure that was central on the 10th over the middle Atlantic States moved rapidly northeastward over Labrador, where it was central on the 11th, a. m., to southern Greenland, where it was central on the 12th, and to the south of Iceland, where it was central on the 13th, at N. 60°, W. 20°; by the 14th, noon, it was about N. 61°, W. 9°. By such a movement this low area lost the characteristic which it first had of a local whirl and acquired the character of a general depression or meiobar, such as characterizes the general circulation of the atmosphere. Thus, on the 9th comparatively small depressions, *C*, *D*, and *F*, existed respectively west of Norway, south of Iceland, and over the Lake region, whereas by the 12th, and especially the 13th, these had expanded and joined with *E* and *G*, so as to form an extensive meiobaric area reaching from Sweden to Greenland and thence to the Lake region. We thus see that as these great depressions break up into cyclonic storms when they are properly fed with air from the surrounding high areas, so on the other hand they develop further by the running together of cyclonic storms when the latter are not maintained in their integrity by an appropriate inflow from the adjoining high areas. If we restrict the words meiobar and pleiobar, as defined in the preceding chapter, to the four great areas of high and low pressure that are usually found on the maps of the Northern Hemisphere, then it may be said that, in general, special storms develop from small depressions only when these are gently fed by the adjoining pleiobars and that when they are not thus nurtured they flatten out and disappear, but when they are overfed they run into and temporarily increase the size and depth of the nearest meiobar.

G and *H.* *G* was a continuation of low No. IX of the United States series that was central on the 13th, a. m., in the upper Lake region and on the 14th, a. m., in the St. Lawrence Valley, but by the 15th, a. m., was central in the Straits of Belle Isle and had been almost overtaken by low No. X of the United States series, which receives the letter *H*. By the 16th, noon, area *G* was central about N. 55° and W. 30°, while *H* was central in Labrador and *F* was between Iceland and Scotland, thus again forming, respectively, the western and eastern ends and the center of the meiobar *F*, *G*, *H*. During the 17th, 18th, and 19th the winds in this meiobaric area appreciably diminished in force, and by the 19th a small area of low pressure, 29.6, between Iceland and Great Britain, was all that remained. On the other hand, unusual areas of high pressure advanced from central Asia westward over Europe and from arctic North America southeastward over the United States, which movements, although at first tending apparently to complete the process of rising pressure over the North Atlantic, yet actually soon resulted in the formation of new cyclonic whirls and low areas. The European high pressure attained its maximum on the 26th, but dominated Europe during the rest of the month.

I. This small depression was central over the Lake region on the 18th, over New England on the 19th, and near the Straits of Belle Isle on the 20th. The central pressure had fallen rapidly. On the 21st it was central near N. 56°, W. 40°; 22d, N. 60°, W. 20°, after which it disappeared, although the neighboring winds indicated that it passed rather far to the north and near to Iceland.

J. This was a continuation of United States series No. XIII,

which was central in the Lake region on the 24th, noon, and passed southeastward over New England. On the 25th, noon, it was central at N. 42°, W. 62°; 26th, noon, N. 40°, W. 57°, after which it disappeared.

K. This was a continuation of United States series No. XI, which was central in the St. Lawrence Valley on the 27th, noon, and passed to the east-northeast, being central on the 29th at about N. 53°, W. 43°, after which it disappeared.

IN GENERAL.

From the 17th to the 30th of the month there was a general tendency in the pressure to increase over the Atlantic Ocean in the belt between Newfoundland and Great Britain, and at the close of the month the pressure in this region ranged between 30.2 and 30.6; high pressure also prevailed over central and western Europe and over all the eastern portion of North America. As this was not an average normal condition of the atmosphere for this season over the ocean, although it fairly represented the tendency over the land, it was expected that a return to the normal condition during the following month of December would be accompanied by severe storms.

OCEAN FOG.

The limits of fog belts west of the fortieth meridian, as determined by reports of shipmasters, are shown on Chart I by dotted shading. Near the Grand Banks of Newfoundland, fog was reported on 17 dates; between the fifty-fifth and sixty-

fifth meridians on 2 dates; and west of the sixty-fifth meridian on 3 dates. Compared with the corresponding months of the last seven years, the dates of occurrence of fog near the Grand Banks numbered 7 more than the average; between the fifty-fifth and sixty-fifth meridians, 1 less than the average. No fog west of the sixty-fifth meridian was reported in November, 1893.

OCEAN ICE.

The limits of the region within which field ice or icebergs were reported for November, 1894, are shown on Chart I by crosses.

The southernmost ice, a berg 1,000 feet long with two high peaks, was reported on the 3d, in N. 47° 05', W. 51° 15'; and the easternmost ice was reported on the 26th, in N. 47° 30', W. 49° 34'. The ice of the current month was noted on one date in the Straits of Belle Isle.

No arctic ice was reported for November, 1892. In November, 1891, an iceberg was observed in N. 51° 58', W. 55° 35', on the 8th. In November, 1890, a small piece of ice was noted in N. 46° 35', W. 47° 51'. In November, 1882, 1883, 1887, and 1888, no ice was reported near Newfoundland and the Grand Banks. In November, 1884 and 1889, several icebergs were seen over the eastern part of the Banks of Newfoundland. On one date in November, 1885, and one date in November, 1886, ice was observed south of the fiftieth parallel.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

DIURNAL PERIODICITY.

The regular diurnal period in temperature is shown by the hourly means given in Table V for all stations having self-registers.

NORMAL TEMPERATURE.

In Table II, for voluntary observers, the mean temperature is given for each station, but in Table I, for the regular stations of the Weather Bureau, both the mean temperatures and the departures from the normal are given for the current month. In the latter table the stations are grouped by geographical districts, for each of which is given the average temperature and departure from the normal; the normal for any district or station may be found by adding the departures to the current average when the latter is below the normal and by subtracting when it is above.

DEPARTURES FROM NORMAL TEMPERATURE FOR NOVEMBER, 1894.

As compared with the normal for November the mean temperatures for the current month were decidedly in excess from Texas, Kansas, Nebraska, western North and South Dakota westward to the Pacific Ocean. The ridge of greatest excess includes the following: Laramie, 9.8; Helena, 8.4; Red Bluff, 6.0; Salt Lake City and Yuma, 5.6; Spokane and Tucson, 5.5.

Considered by districts, the mean temperatures for the current month show the following departures from normal temperatures:

Positive departures: Northern slope, 4.8; middle slope, 2.4; southern slope (Abilene), 2.1; southern plateau, 4.5; middle plateau, 4.3; northern plateau, 5.1; north Pacific, 1.4; middle Pacific, 3.7; southern Pacific, 0.6.

Negative departures: New England, 3.5; middle Atlantic, 3.0; south Atlantic, 2.1; Key West, 0.6; east Gulf, 1.7; west Gulf, 0.4; Ohio Valley and Tennessee, 3.8; lower lakes, 4.2; upper lakes, 4.1; North Dakota (extreme northwest), 1.3; upper Mississippi, 4.5; Missouri Valley, 1.2.

For certain voluntary stations of rather long periods of observation the normal and extreme mean temperatures and the departures are shown in detail in Table Xa, which is now placed among the meteorological tables instead of being inserted in the text as heretofore.

YEARS OF HIGHEST MEAN TEMPERATURE FOR NOVEMBER.

The mean temperature for November, 1894, was the highest on record at regular Weather Bureau stations as shown in the following table, which also gives the highest previous record:

Stations.	November, 1894.		Highest previous.	
	Mean temperature.	Departure from normal.	Temperature.	Year.
Wichita, Kans.	46.0	+2.5	45.9	1890
Santa Fe, N. Mex.	43.2	+5.1	42.7	1873
Tucson, Ariz.	62.5	+5.5	58.6	1892
Yuma, Ariz.	68.3	+5.6	65.2	1890
Pueblo, Colo.	43.6	+2.9	42.3	1892
Denver, Colo.	44.8	+4.8	42.9	*
Cheyenne, Wyo.	41.0	+5.6	39.3	1873
Lander, Wyo.	36.8	+9.8	34.3	1887
Salt Lake City, Utah.	45.6	+5.6	44.2	1891
Helena, Mont.	41.0	+8.4	39.1	1885
Walla Walla, Wash.	47.2	+4.7	46.8	1892
Spokane, Wash.	42.9	+5.5	41.1	1885
Olympia, Wash.	47.4	+2.2	47.2	1891
Red Bluff, Cal.	59.4	+6.0	58.0	1890
Carson City, Nev.	44.4	+2.7	44.4	1891
Sacramento, Cal.	58.2	+4.8	55.9	1891
San Francisco, Cal.	59.4	+3.4	59.0	1890
Fresno, Cal.	58.6	+3.2	56.9	1890

* Frequently.

YEARS OF LOWEST MEAN TEMPERATURE FOR NOVEMBER.

The mean temperature for November, 1894, was the lowest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	November, 1894.		Lowest previous.	
	Mean temperature.	Departure from normal.	Temperature.	Year.
Vineyard Haven, Mass.....	43.8	-2.0	44.4	*
Block Island, R. I.....	42.3	-3.4	27.4	1882
Nantucket, Mass.....	41.6	-3.0	43.1	1892
Northfield, Vt.....	28.4	-4.6	31.6	1890
Harrisburg, Pa.....	40.0	-2.4	40.4	1893
Parkersburg, W. Va.....	40.3	-3.8	40.5	1892
Sault Ste. Marie, Mich.....	27.5	-3.7	29.0	1892
Green Bay, Wis.....	29.8	-2.8	29.8	1892

*Frequently.

MAXIMUM TEMPERATURE.

The maximum temperatures of the month at regular stations of the Weather Bureau are given in Table I, from which it appears that the highest maxima were: Yuma, 92; Tucson and Red Bluff, 87; Tampa, 85; Jupiter, 84; Key West and Dodge City, 83; Jacksonville, Corpus Christi, Palestine, Wichita, and Fresno, 82; Pueblo and Titusville, 81; Shreveport and Vicksburg, 80.

The lowest maxima were: St. Vincent, 45; Duluth, Marquette, and Sault Ste. Marie, 48; Green Bay and Alpena, 51; St. Paul, 52; Moorhead and La Crosse, 53.

YEARS OF HIGHEST MAXIMUM TEMPERATURE FOR NOVEMBER.

The maximum temperatures for November were the highest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	November, 1894.		Highest previous.	
	Maximum.	Excess above previous record.	Temperature.	Year.
Buffalo, N. Y.....	70	0	70	1891
Rapid City, S. Dak.....	79	+2	77	1891
Laramie, Wyo.....	72	+3	69	1890
Pueblo, Colo.....	81	+3	78	1890
Havre, Mont.....	72	+1	71	1887
Helena, Mont.....	71	+3	68	1891
Sacramento, Cal.....	78	0	78	*
San Francisco, Cal.....	79	+1	78	*
Fresno, Cal.....	82	0	82	1890
Yuma, Ariz.....	92	0	92	1891

*Frequently.

MINIMUM TEMPERATURE.

The minimum temperatures of the month at regular stations of the Weather Bureau are given in Table I, from which it appears that the lowest minima were: St. Vincent, -25; Moorhead and Laramie, -14; Williston, -10; Bismarck, -9; Sault Ste. Marie, -7; Duluth, -6; St. Paul and Northfield, -2; Marquette, -1.

Among the highest minima were: Key West, 60; Jupiter, 48; San Francisco, 46; San Diego and Yuma, 45; Point Reyes Light and Corpus Christi, 42; Galveston, 41; Titusville, 40.

YEARS OF LOWEST MINIMUM TEMPERATURE FOR NOVEMBER.

The minimum temperatures for November were the lowest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	November, 1894.		Lowest previous.	
	Minimum.	Deficit below previous record.	Temperature.	Year.
Cape Henry, Va.....	22	-2	24	1880
Sault Ste. Marie, Mich.....	-7	-5	-2	1891
Wichita, Kans.....	10	0	10	1891

MONTHLY MEAN TEMPERATURE.

For the regular stations of the Weather Bureau the monthly mean temperature is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

During November, 1894, the highest mean temperatures at regular Weather Bureau stations were: Key West, 73.6; Jupiter, 71.0; Yuma, 68.3; Tampa, 67.0; Titusville, 66.0; Corpus Christi, 65.1; Galveston, 63.8; Tucson, 62.5; Port Eads, 61.9; Jacksonville, 61.4; New Orleans, 60.5.

ACCUMULATED TEMPERATURES.

From January 1 to the end of the current month the average temperature for each geographical district was above or below the normal by an amount that is given in the last column of the following table. The accumulated monthly departures from normal temperatures, as given in the second column, may be used for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Average.	Total.		Average.	Total.
New England.....	+9.1	+0.8	Key West.....	-6.5	-0.1
Middle Atlantic.....	+13.1	+1.2	East Gulf.....	-1.6	-0.1
South Atlantic.....	+4.9	+0.4	Southern plateau.....	-10.0	-0.9
West Gulf.....	+0.5	+0.0	Middle plateau.....	-4.4	-0.4
Ohio Valley and Tennessee.....	+11.7	+1.1	Northern Pacific.....	-7.6	-0.7
Lower Lake.....	+20.5	+1.9	Middle Pacific.....	-6.8	-0.6
Upper Lake.....	+25.0	+2.3	Southern Pacific.....	-21.3	-1.9
North Dakota (Ex. NW.).....	+24.2	+2.2			
Upper Mississippi.....	+21.5	+2.0			
Missouri Valley.....	+21.4	+1.9			
Northern slope.....	+10.9	+0.9			
Southern slope (Abilene).....	+7.0	+0.6			
Northern plateau.....	+1.3	+0.1			

DAILY AND MONTHLY RANGES OF TEMPERATURE.

The greatest daily range of temperature is given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station:

Greatest daily ranges.—Large values: Pueblo, 56; North Platte, 54; Rapid City, 53; Valentine, 52; Carson City, 50; Havre, Dodge City, Winnemucca, and Wichita, 48; Pierre and Laramie, 47; Miles City, Cheyenne, and Concordia, 46. Small values: Tatoosh Island, 11; Key West, 12; Astoria, 13; East Clallam and Galveston, 15; Port Angeles, 16; Pysht, Seattle, and Fort Canby, 17; Port Crescent and Atlantic City, 19; Hatteras and Jupiter, 20.

Extreme monthly ranges.—Large values: Laramie, 86; Rapid City, 78; Havre, 74; Dodge City, 73; Bismarck, Pierre, Valentine, and Wichita, 72; Cheyenne and Williston, 71; St. Vincent, Denver, and Oklahoma, 70. Small values: Tatoosh Island, 20; Key West, 23; Port Angeles, 26; Port Crescent and Pysht, 27; Seattle, 28; Astoria, 29; Fort Canby and Neah Bay, 30.

LIMITS OF FREEZING TEMPERATURE.

The region within which the air has had a freezing temperature at some time during the month is bounded by the isotherm of minimum 32°. The isotherm of minimum 40° presents, approximately, the boundary of the region within which severe frosts are likely to have occurred. During the winter season these lines are shown on the chart of snowfall, No. V.

The line of minimum 40° passes from Titusville southwest across Florida, a little south of Tampa. It reappears just north of Galveston and runs parallel to the coast of southern Texas to Rio Grande City. It reappears in southern Arizona, passes northwest midway between Tucson and Yuma, crosses southern California to the coast near Los Angeles, and

passes up along the immediate coast to a point midway between San Francisco and Eureka.

The line of minimum 32° passes from the coast near Kittyhawk southwest along the coast to a point midway between Savannah and Jacksonville and then across Florida to Cedar Keys. It reappears between Mobile and New Orleans, passes through the center of Louisiana, and thence southeast through San Antonio. It reappears east of Tucson and passes northwest through central California to the southwest corner of Oregon.

PERIODS OF HIGH TEMPERATURE.

The maximum temperatures of November in the respective States occurred principally at the following periods:

(A) 1st, northern Minnesota and Michigan, southern Indiana and Ohio, Kentucky, Tennessee, Arkansas, northern Louisiana, and eastern Texas; 2d, throughout Michigan, Lakes Erie, Huron, and Ontario, New York, Pennsylvania, Maryland, West Virginia, and the coast of North Carolina; 3d, New England, New Jersey, the coast of Virginia, and Titusville.

(B) 6th, western Oregon; 7th, Washington, Oregon, California.

(C) 11th, Montana and Wyoming; 12th, Kansas.

(D) 14th, North and South Dakota, Wyoming, and Nebraska; 15th, northern Texas, Oklahoma, Missouri, eastern Iowa, northern Illinois; 16th and 17th, southern Alabama, western Florida, southern Mississippi, Georgia, North and South Carolina.

(E) 26th, Utah, Iowa, western Wisconsin, and northern Missouri.

PERIODS OF LOW TEMPERATURE.

The minimum temperatures of November in the respective States occurred principally at the following periods:

(A) 11th, eastern Kansas, southern Missouri, central Arkansas; 12th, the Ohio Valley, Kentucky, Tennessee, western North Carolina, Mississippi, Alabama, Georgia, South Carolina, and Florida.

(B) 16th, Washington, Oregon, Idaho, western Montana, Wyoming, northern California, northern Nevada, northern Utah, northern Colorado; 17th, southern Colorado, western Kansas, New Mexico, Oklahoma, Texas; 18th, eastern Arizona, eastern Montana, western North and South Dakota; 19th, eastern Nebraska, Iowa, northern Missouri and Illinois, Wisconsin, and northern Michigan; 20th, Lake Huron, Pennsylvania, Connecticut, western Massachusetts, eastern New York, Vermont, New Hampshire, southern Maine, Rhode Island, and southern Massachusetts.

(C) 28th, Manitoba, eastern part of North Dakota, Minnesota; 29th, a narrow belt including the following stations: Port Huron, Sandusky, Parkersburg, Lynchburg, Wilmington, Norfolk, Washington, Baltimore, Atlantic City, Block Island, Nantucket; these stations lie just outside of the region that experienced its minimum temperature on the 20th, showing that the cold area of the 29th overlapped and pushed beyond its predecessor of the 20th by at least this much.

REGIONS OF 20° RISE IN TWENTY-FOUR HOURS.

The daily weather charts show by heavy dotted lines the regions within which the temperature has risen 20° in the preceding twenty-four hours. The following list enumerates all of these regions and gives the dimensions of the principal axes in miles:

(A) 1st, a. m., 200 by 200, Missouri and Arkansas, and 200 by 150, southern Texas.

(B) 3d, a. m., 200 by 150, South Dakota.

(C) 5th, p. m., 300 by 200, Assiniboia and Montana. 6th, a. m., 300 by 200, Montana.

(D) 7th, a. m., 300 by 100, Colorado and northern Texas, and 300 by 200, Illinois and Missouri; p. m., 200 by 100, Tennessee and Kentucky.

(E) 10th, p. m., 300 by 200, Alberta. 11th, a. m., 300 by 300, Alberta, Saskatchewan, Montana; p. m., 800 by 800(?), Saskatchewan, Assiniboia, Manitoba, Montana, North and South Dakota, Nebraska. 12th, a. m., 500 by 500, Manitoba, North and South Dakota, and portions of Minnesota, Montana, Nebraska; p. m., 500 by 400, Kansas, Missouri, Oklahoma. 13th, a. m., 500 by 200, Indiana, Kentucky, Tennessee, Mississippi, and Alabama.

(F) 14th, a. m., 500 by 200, Assiniboia, Montana; p. m., 600 by 300, Montana, South Dakota, Nebraska, Wyoming. 15th, a. m., 200 by 100, Oklahoma and Kansas; p. m., 300 by 150, portions of Kentucky, Indiana, Ohio. 16th, a. m., 200 by 100, portions of Mississippi and Alabama. The small areas of the last three dates, although not necessarily continuations of the large area of the 14th, p. m., are to be regarded as the results of inflow from the south and east sides into the same area of low pressure instead of from the southwest side. This process ended in the following warm area, namely, 17th, a. m., 300 by 100, Virginia, North and South Carolina.

(G) 17th, a. m., 800 by 300, Alberta, Montana, Wyoming, Colorado, and South Dakota; p. m., 800 by 400, Wyoming, South Dakota, Nebraska, Colorado, Kansas, northern Texas. 18th, a. m., 600 by 600, Colorado, Kansas, Oklahoma, and portions of Iowa and Texas.

(H) 19th, p. m., 1,000 by 400, Assiniboia, Montana, Wyoming, North and South Dakota, Nebraska. 20th, a. m., 1,400 by 600, Manitoba, Ontario, Lake Superior, Wisconsin, Minnesota, Iowa, South Dakota, Nebraska, Kansas, and portions of Colorado and Illinois; p. m., 900 by 400, Ontario, Lakes Huron and Michigan, Illinois, Michigan, and portions of Wisconsin, Missouri, and Indiana. 21st, a. m., 500 by 700, Ontario, lower Lakes, and the coast from New Jersey to the Bay of Fundy; p. m., 500 by 500, Quebec, Maine, New Brunswick, Nova Scotia. 22d, a. m., 200 by 300, New Brunswick, Nova Scotia, Cape Breton.

(I) 21st, a. m., 300 by 500, Alberta, Assiniboia, Saskatchewan. This warm region, due to an inflow from the south and west, disappeared and was followed by the following warm areas, due to an inflow from the south and east: 22d, a. m., 300 by 200, Iowa, Missouri, Illinois; 400 by 100, Texas and Louisiana; p. m., 400 by 200, Illinois, Indiana, Ohio. 23d, a. m., 200 by 200, West Virginia.

(J) 26th, a. m., 200 by 200, North and South Dakota; p. m., 300 by 200, Ontario and Lake Superior. 27th, a. m., 300 by 100, Ontario, Lake Ontario, and a portion of New York. This warm area, due to an inflow from the southwest, was followed by the following, due to an inflow from the southeast: 27th, a. m., 600 by 200, Tennessee, Kentucky, West Virginia, Ohio.

(K) 28th, a. m., 300 by 400 (?), Alberta. This warm area did not appear on the 28th, p. m., although temperature rose to the 20° limit at one or two stations, but it reappeared as follows: 29th, a. m., 700 by 700, Manitoba, Ontario, North Dakota, Minnesota, Wisconsin; p. m., 400 by 200, Ontario and Lake Superior.

(L) 29th, p. m., 400 by 100, Oklahoma and Missouri. This warm area accompanied the inflow from the east into a relatively low area that had appeared in Texas. 30th, a. m., 300 by 100, Kentucky and Ohio.

REGIONS OF 20° FALL IN TWENTY-FOUR HOURS.

A fall of temperature of 20°, or more, in twenty-four hours is indicated on the Daily Weather Map by inclosing the region within which this occurs by a heavy dotted line. According to recent instructions such falls are no longer to be regarded as technical cold waves, the exact definition of which is given in the subsequent paragraph. The following list enumerates the regions of 20° fall for the month of November and the dimensions of the principal axes are stated in miles:

(A) 3d, a. m., 200 by 100, Illinois and Tennessee; p. m., 200 by 100, Ohio and West Virginia.

(B) 4th, a. m., 300 by 200, Wyoming.

(C) 7th, a. m., 200 by 100, Assinniboia and Montana.

(D) 8th, a. m., 400 by 150, Nebraska and South Dakota.

(E) 8th, p. m., 300 by 600 (?), Alberta and Assinniboia. 9th, a. m., 600 by 300, Saskatchewan, Assinniboia, Alberta, and Montana; p. m., 700 by 200, Manitoba, North and South Dakota, and Nebraska. 10th, a. m., 400 by 300, Manitoba, Minnesota, and Wisconsin, and also 200 by 100, Kansas; p. m., 150 by 150, Texas.

(F) 13th, a. m., 100 by 100, South Dakota, and 100 by 100, Wyoming.

(G) 14th, p. m., 200 by 200, Alberta. 15th, a. m., 600 by 600, Alberta, Saskatchewan, Assinniboia, and Montana; p. m., 1,200 by 900, Saskatchewan, Alberta, Assinniboia, Montana, North and South Dakota, Minnesota, Nebraska, Wyoming, Colorado, Idaho, Utah, Oregon, and Nevada. 16th, a. m., 1,600 by 600, Manitoba, North and South Dakota, Minnesota, Wisconsin, Iowa, Nebraska, northern Texas, Colorado, Wyoming, Montana, Utah, Idaho, Nevada, and Oregon; p. m., 1,200 by 500, Wisconsin, Iowa, Illinois, Missouri, Kansas, Nebraska, Utah, Oklahoma, Texas, Arkansas. 17th, a. m., 100 by 200, Wisconsin, and 1,100 by 400, Illinois, Missouri, Arkansas, Oklahoma, northern Texas, and New Mexico; p. m., 900 by 200, western Pennsylvania, West Virginia, southern Ohio, Kentucky, Tennessee, Mississippi, and northern Alabama. 18th, a. m., 300 by 100, western Tennessee.

(H) 17th, p. m., 400 by 300, Alberta, Saskatchewan, Assinniboia. 18th, a. m., 900 by 500, Alberta, Saskatchewan, Assinniboia, Manitoba, Montana, North and South Dakota; p. m., 1,100 by 400, Manitoba, Montana, North and South Dakota, Minnesota, Wisconsin, Iowa, and Nebraska. 19th, a. m., 1,400 by 400, Ontario, the upper Lake region, Wisconsin, Iowa, Kansas, Nebraska; p. m., 400 by 300, Ontario, Quebec, Vermont, New York, and Lake Ontario. 20th, a. m., 600 by 300, New Brunswick, Nova Scotia, Quebec, and New England; p. m., 300 by 200, Nova Scotia and Cape Breton.

(I) 20th, p. m., 500 by 200, Montana, Wyoming, and South Dakota. 21st, a. m., 500 by 300, South Dakota, Iowa, and portions of Minnesota, Nebraska, and Missouri.

(J) 22d, a. m., 700 by 200, Nevada, Idaho, Utah, and Wyoming; p. m., 300 by 200, Colorado. 23d, a. m., 200 by 150, Kansas and Oklahoma.

(K) 24th, a. m., 300 by 100, Kentucky and Tennessee.

(L) 26th, p. m., 400 by 300, Alberta, Assinniboia, Saskatchewan, and Montana. 27th, a. m., 800 by 300, Saskatchewan, Assinniboia, Manitoba, North Dakota; p. m., 1,200 (?) by 600, Manitoba, Ontario, Lake Superior, Wisconsin, Minnesota, North and South Dakota, Nebraska, Kansas, Iowa, Missouri, Illinois, Wisconsin, and Upper Michigan. 28th, a. m., 1,200 (?) by 1,000 (?). We have here three areas closely adjoining each other, separated by small areas of cloud and snow and, in general, covering Manitoba, Ontario, the Lake region, Wisconsin, Minnesota, Iowa, Missouri, Illinois, Kentucky, Indiana, Ohio, and Michigan. 28th, p. m., 2,000 by 300, Oklahoma, Arkansas, Tennessee, Kentucky, North Carolina, Virginia, West Virginia, Ohio, Pennsylvania, Maryland, Delaware, New Jersey, Long Island, Rhode Island, and the shores of Massachusetts, New Hampshire, Maine and southern Nova Scotia. 29th, a. m., 300 by 300, Virginia, North and South Carolina.

COLD-WAVE SIGNALS FOR NOVEMBER.

According to recent instructions (No. 75 of 1894) the cold-wave signal, namely, the white flag with black center, will be displayed during the months of March to November, inclusive, whenever, in the judgment of the forecast official, the fall of temperature in twenty-four hours is expected to be at least 18° and to reach at least 32° in the district north of Arkan-

sas and between the Mississippi River and the Rocky Mountains, including Minnesota; at least 16° and to reach 36°, in the region of Tennessee and North Carolina and east of the Mississippi River, including St. Louis; at least 16° and to reach 40°, in all other districts east of the Rocky Mountains, except along the Gulf coast and in Florida; at least 16° and to reach 42°, along the Gulf coast and in Florida. During the months of December, January, and February the first limit remains the same, but the second limit is placed 6° lower. When cold-wave signals are not ordered and the temperature falls 4° more than the first limit and reaches 4° below the second limit, such falls will be considered as cold waves without signals.

In accordance with these instructions the following cold-wave signals were ordered during the month of November:

2d, p. m., Milwaukee and Chicago.

8th, p. m., Williston, Pierre, Huron, Cheyenne, Lander, Denver, Valentine, and North Platte.

12th, p. m., Rapid City, Pierre, Cheyenne, Lander, and Denver.

14th, p. m., Rapid City, Pierre, Valentine, and Moorhead.

15th, a. m., Cheyenne, Lander, Denver, Pueblo, and North Platte.

15th, p. m., Oklahoma, Amarillo, Duluth, Dubuque, Davenport, Keokuk, St. Louis, Springfield, Mo., Columbia, Mo., Hannibal, Fort Smith, Green Bay, Milwaukee, Springfield, Ill., Cairo, Marquette, Yankton, Omaha, Concordia, Wichita, Dodge City, Topeka, Sioux City, Des Moines, Minneapolis, St. Paul, and Duluth.

16th, a. m., San Antonio, Abilene, Palestine, Little Rock, Shreveport, Cincinnati, Louisville, Nashville, Memphis, Vicksburg, Cairo, and Indianapolis.

16th, p. m., Galveston, New Orleans, Columbus, Knoxville, Chattanooga, Vicksburg, Meridian, Pittsburg, Parkersburg, Atlanta.

17th, a. m., Mobile, Pensacola, Harrisburg, Atlantic City, Baltimore, Washington, Lynchburg, Richmond, Raleigh, Charlotte, Columbia, S. C., Augusta, Dubuque, Davenport, Keokuk, Minneapolis, St. Paul, Duluth, La Crosse.

17th, p. m., Rapid City, Pierre, Huron, Yankton, Valentine, Moorhead.

18th, a. m., Kansas City, North Platte, Omaha, Concordia, Topeka, Sioux City, Des Moines.

18th, p. m., Alpena, Grand Haven, Port Huron, Detroit, Toledo, Sandusky, Cleveland, Columbus, Cincinnati, Louisville, Buffalo, Rochester, Oswego, Ithaca, Erie, Pittsburg, Parkersburg, Northfield, Springfield, Ill., Cairo, Marquette, Sault Ste. Marie, Indianapolis, Columbia, Mo., St. Louis, Springfield, Mo., Hannibal, Wichita, Dodge City, La Crosse, Milwaukee, Chicago.

19th, a. m., Albany, New York, Harrisburg, Philadelphia, Portland, Boston, New London, New Haven, New Brunswick, Atlantic City, Baltimore, Washington, Lynchburg.

19th, p. m., Rapid City, Cheyenne, Lander, Denver, Pueblo.

20th, a. m., Huron, Yankton, Pierre, Valentine, Omaha, Sioux City, Des Moines, Dubuque.

25th, a. m., Oswego, Albany, Northfield, Davenport, La Crosse, Green Bay, Milwaukee, Chicago.

25th, p. m., Portland.

26th, a. m., Huron, Yankton, Pierre, Valentine, Sioux City, Moorhead.

26th, p. m., St. Paul, Duluth, Minneapolis, Des Moines, Dubuque, Davenport, La Crosse, Green Bay, Milwaukee, Chicago.

27th, a. m., Oklahoma, Abilene, Fort Smith, Little Rock, Columbus, Cincinnati, Louisville, Nashville, Memphis, Pittsburg, Parkersburg, Marquette, Sault Ste. Marie, Alpena, Grand Haven.

27th, p. m., Cairo, Knoxville, Chattanooga, Ithaca, Albany, Harrisburg, Northfield.

FROST WARNINGS FOR NOVEMBER, 1894.

The following are the frost warnings issued during the current month in connection with the respective high areas:

High No. II.—3d, a. m., Alabama, central and northern portions.

High No. III.—5th, a. m., North and South Carolina and Georgia, probably in the interior, western Florida, Louisiana, eastern Texas, in the interior, Arkansas, Tennessee, and Kentucky. 6th, a. m., Virginia, North and South Carolina, eastern and western Florida in the interior.

High No. VI.—10th, a. m., North and South Carolina and Georgia, eastern Florida, northern portion, Alabama, Mississippi, and Louisiana in the interior, eastern Texas in the interior. 11th, a. m., special to Florida stations.

High No. VIII.—Eastern Florida.

FROSTS.

The frosts reported by the voluntary observers of the Weather Bureau usually have reference to the injury done to tender plants, and the classification "light" or "heavy" depends almost entirely upon the nature of the plant. In general, it may be assumed that a light frost will injure the most sensitive vegetables that are raised by methods of forcing, while the heavy frosts will injure hardy fruits and grains that ripen in the open air. In both cases, however, the extent of the injury will largely depend upon the location of the plant, namely, whether in a quiet valley or on an elevated spot. The meteorologic phenomenon of hoar frost accompanies the occurrence of a frost properly so called by the agriculturist; a freezing temperature without hoar frost is a dry freeze or a cold wave, according to its intensity. The isotherms of minimum 40° and minimum 32° are shown on Chart VI.

The principal frosts of November occurred in the southern portion of the United States as follows: 1st, from Maryland to South Carolina, and killing frost in Illinois; 2d, from New York to Virginia; 3d, from Minnesota south to Louisiana; 4th, from Kentucky to Louisiana; 6th, from eastern Texas and Arkansas to Maryland; 7th, from Louisiana to the south Atlantic coast and Virginia; 9th, Arkansas and Louisiana; 10th, Arkansas; 11th, South Carolina and Georgia; 12th, and 13th, Florida; 17th, southern Texas and southern California; 19th and 20th, southern California; 22d and 23d, northern California; 28th, southern California; 29th, central California.

The following table shows the dates of the occurrence of the first light and heavy frosts and the first snow of the season at the respective stations. When the observer makes no mention of frost the first occurrence of a minimum temperature of 32° is selected and the date is given in the table. The dagger at the right of the name of the station indicates, therefore, a minimum temperature of 32° with or without frost:

Dates of first light and heavy frosts and snow, November, 1894.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Alabama.				Alabama—Cont'd.			
Alco†				Highland Home		6	
Ashville†				Jasper†		1	
Bermuda†				Madison Station†		4	
Carrollton†				Mobile		7	
Citronelle†				Mount Willing		6	
Claiborne				Newbern		6	
Collins†				Oxanna†		6	
Daphne				Pine Apple†		4	
Decatur†				Pushmataha		11	
Eufaula†				Rock Mills		6	
Evergreen†				Scottsboro†		6	
Florence†				Thomasville†		7	
Fort Deposit†				Tuscaloosa†		5	
Gadsden†				Tusculum†		6	
Greensboro				Union		6	
Healing Springs†				Union Springs†		6	

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Alabama—Cont'd.				Colorado—Cont'd.			
Uniontown†				Smoky Hill Mine			15
Arizona.				Springfield			15
Benson†				Stamford			1
Calabasas†				T. S. Ranch			16
Eagle Pass†				Vernon			15
Navajo†				Watkins			15
Parker				Connecticut.			
Red Rock†				Bridgeport			5
Walnut Ranch†				Canton			5
Arkansas.				Colchester†			5
Brinkley†				Falls Village			5
Corning				Greenfield Hill			7
Dallas†				Hartford			5
Forrest†				Middletown			5
Helen†				New Hartford			5
Malvern†				New Haven			5
Mount Nebo†				New London			5
Osceola†				North Grosvenor Dale			5
Rogers†				Southington			5
California.				South Manchester			5
Agnew†				Storrs			5
Barstow†				Thompson			5
Bethany				Voluntown			5
Crescent City				Wallingford			5
Eureka				Waterbury			5
Fall Brook				West Simsbury			5
Folsom City				Delaware.			
Fresno (near)				Dover			12
Georgetown				Seaford			9
Greenville				Wilmington			9
Hydesville				District of Columbia.			
Iowa Hill				West Washington			13
Jackson				Florida.			
Julia				Amelia			6
Kennedy Gold Mine				Archer			11
La Grange				Brooksville			12
Lodi				De Land			13
Los Angeles				Eustis			13
Middletown†				Federal Point			13
Mokelumne Hill				Grasmere			12
Napa				Green Cove Springs†			12
Nordhoff†				Homeland			12
Oakdale†				Jacksonville			7
Oleta				Lake City			7
Palermo				Moseley Hall			7
Paso Robles†				New Smyrna			12
Placerville				Orange City			12
Pleasanton†				Orange Park			6
Red Bluff				Orlando			11
Reedley (near)				Pensacola			12
Repres†				Plant City			12
Riverside				Tallahassee			7
Rosewood				Tampa			12
Sacramento				Tarpon Springs			16
San Francisco				Georgia.			
San Jacinto				Alapaha			7
San Jose				Albany†			7
San Luis Obispo				Americus†			7
San Rafael				Athens			6
Santa Cruz				Atlanta			6
Santa Paula†				Augusta			6
Stanford University				Bainbridge†			7
Sutter Creek†				Blakely			7
Tulare				Camak†			7
Turlock				Canton			6
Ukiah				Columbus†			7
Vacaville				Cordele†			7
West Butte				Covington†			6
Wheatland				Darien			12
Winchester†				Eastman†			7
Wire Bridge				Elberton†			5
Yuba City				Forsyth			7
Colorado.				Fort Gaines†			7
Avoca				Gainesville†			6
Boxelder				Gillsville†			12
Byers				Griffin†			10
Climax				Hawkinsville			11
Collbran				Lagrange			6
Cope				Louisville			6
Deertrail				Macon			7
Downing				Marietta			8
Dumont				Marshallville			1
First View				Millen†			6
Fleming				Monticello†			11
Fort Collins				Newnan†			4
Greeley				Piscola			12
Holly				Point Peter†			6
Hugo				Poulan			7
Julesburg				Quitman†			7
Lake Moraine				Ramsey			11
Las Animas				Savannah			6
Lavender				Talbotton†			7
Lay				Union Point†			7
Le Roy				Washington†			7
Leslie				Way Cross			12
Loveland				Waynesboro			7
Rangely				West Point†			7
Rico				Idaho.			
Rocky Ford				Boise Barracks			30
St. Cloud				Chesterfield			15
Scissors				Fort Sherman			17
Seibert				Garden Valley			30

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Idaho—Cont'd.</i>				<i>Iowa—Cont'd.</i>			
Kootenai.....			22	Monticello.....			9
Moscow.....			18	Moore.....			10
Murray.....			18	North McGregor.....			9
Salubria.....			23	Ogden.....			9
<i>Illinois.</i>				Osage.....			7
Albion.....			10	Osceola.....			10
Aurora.....			7	Oskaloosa.....			15
Bloomington.....			7	Ottumwa.....			9
Braidwood.....			3	Richland.....			16
Carlinville.....			10	Rockwell City.....			9
Carrollton.....			10	Seymour.....			16
Chemung.....			7	Vinton.....			10
Chicago.....			7	Williams.....			13
Decatur.....			9	Wilton.....			10
Dixon.....			7	<i>Kansas.</i>			
East Peoria.....			10	Achilles.....			10
Effingham.....			15	Collyer.....			15
Port Sheridan.....			9	Coolidge.....			10
Galva.....			2	Englewood.....			16
Goldconda.....			10	Eureka.....			10
Greenville.....			10	Garden City.....			12
Havana.....			10	Garfield.....			10
Herrins Prairie.....			10	Gibson.....			16
Kankakee.....			9	Gove.....			15
Louisville.....			10	Hutchinson.....			16
Martinsville.....			9	Jaqua.....			15
Monmouth.....			9	Johnson.....			16
Mount Pulaski.....			10	Leoti.....			16
Olney.....			10	Manhattan.....			16
Oswego.....			6	Morland.....			10
Ottawa.....			7	Morton.....			16
Paris.....			9	Mount Hope.....			16
Peoria.....			10	Sharon Springs.....			15
Philo.....			9	Tribune.....			16
Rantoul.....			7	Ulysses.....			16
Riley.....			7	Wallace.....			16
Rushville.....			10	Wellington.....			23
St. John.....			10	Wichita.....			9
Springfield.....			10	Winona.....			15
Sycamore.....			7	<i>Kentucky.</i>			
Walnut.....			2	Alpha.....			4
Winnebago.....			7	Blandville.....			11
<i>Indiana.</i>				Carrollton.....			5
Angola.....			7	Cattlettsburg.....			11
Butler.....			5	Earlington.....			10
Cambridge City.....			7	Eddyville.....			6
Columbia City.....			8	Edmonton.....			10
Columbus.....			11	Eubank.....			10
Connersville.....			11	Franklin.....			9
De Gonia Springs.....			11	Greendale.....			11
Delphi.....			6	Greensburg.....			10
Evansville.....			11	Harrodsburg.....			10
Farmland.....			7	Henderson.....			6
Franklin.....			3	Louisia.....			10
Hammond.....			7	Louisville.....			10
Indianapolis.....			9	Marrowbone.....			10
Jasper.....			10	Matlock.....			10
Jeffersonville.....			10	Mount Sterling.....			5
Kokomo.....			10	Pellville.....			10
Lafayette.....			9	Richmond.....			6
Logansport.....			6	Shelby City.....			10
Madison.....			10	South Fork.....			10
Marion.....			10	Williamsburg.....			10
Mauzy.....			7	<i>Louisiana.</i>			
Mount Vernon.....			11	Abbeville.....			4
Plymouth.....			6	Alexandria.....			7
Princeton.....			10	Bastrop.....			6
Rockville.....			9	Haton Rouge.....			12
Rushville.....			11	Calhoun.....			6
Scottsburg.....			5	Cheneyville.....			4
Seymour.....			10	Clinton.....			6
South Bend.....			6	Cinclare.....			6
Terre Haute.....			10	Donaldsonville.....			7
Valparaiso.....			10	Emilie.....			12
Vevay.....			10	Franklin.....			12
Worthington.....			11	Grand ocean.....			6
<i>Indian Territory.</i>				Houma.....			12
Healdton.....			3	Lafayette.....			12
<i>Iowa.</i>				Lake Providence.....			6
Algona.....			9	Maurepas.....			4
Amana.....			10	Minden.....			11
Carroll.....			20	Natchitoches.....			3
Cedar Falls.....			29	New Orleans (near).....			12
Cedar Rapids.....			13	Oberlin.....			12
Cresco.....			2	Opelousas.....			4
Davenport.....			2	Rayne.....			12
Decorah.....			7	Shriever.....			7
Elkader.....			7	Shreveport.....			17
Fairfield.....			16	Sugar Experm't Station.....			11
Forest City.....			9	Thibodeaux.....			8
Galva.....			11	<i>Maine.</i>			
Grundy Center.....			9	Bar Harbor.....			5
Hampton.....			7	Calais.....			6
Hawkeye.....			7	Cornish.....			6
Hopkinton.....			9	Easton.....			6
Independence.....			9	Eastport.....			6
Keokuk.....			10	Fairfield.....			5
Kossauqua.....			10	Gardiner.....			5
Knoxville.....			6	Houlton.....			6
Larrabee.....			9	Lewiston.....			5
Mason City.....			9	Orono.....			6
Mechanicsville.....			16	Portland.....			6

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Maryland.</i>				<i>Michigan—Cont'd.</i>			
Bachmans Valley.....			10	Lewiston.....			5
Baltimore.....			12	Madison.....			5
Boethersville.....			7	Mayville.....			5
Burkittsville.....			7	Northport.....			6
Cherryfields.....			7	Old Mission.....			11
Cumberland.....			10	Ovid.....			9
Denton.....			6	Paris.....			7
Easton.....			12	Parkville.....			16
Fallston.....			10	Pontiac.....			6
Frederick.....			12	Port Huron.....			6
Great Falls.....			12	St. Ignace.....			7
Mardela Springs.....			5	St. Johns.....			9
Mt. St. Marys College.....			7	Sand Beach.....			8
Popes Creek.....			3	Stanton.....			5
Solomons.....			12	Thornville.....			6
Taneytown.....			11	Vandalia.....			6
<i>Massachusetts.</i>				Ypsilanti.....			6
Amherst.....			6	<i>Minnesota.</i>			
Bedford.....			6	Ada.....			11
Beverly Farms.....			6	Dawson.....			9
Blue Hill.....			6	Grand Meadow.....			2
Boston.....			6	Hutchinson.....			8
Brookton.....			6	Jadis.....			8
Cambridge.....			6	Lake Winnibagoish.....			3
Chestnut Hill.....			6	Maseppa.....			7
Concord.....			6	Minnesota City.....			7
Dudley.....			6	Pine River.....			7
East Templeton.....			6	St. Charles.....			2
Egg Rock, Nahant.....			6	St. Paul.....			2
Fall River.....			6	St. Peter.....			9
Fitchburg.....			5	Sunrise.....			7
Framingham.....			5	Wabasha.....			7
Gilbertville.....			5	Winona.....			1
Groton.....			5	<i>Mississippi.</i>			
Hadley.....			7	Agricultural College.....			6
Hingham.....			5	Biloxi.....			11
Hyannis.....			25	Briers.....			11
Lake Cochituate.....			2	Brookhaven.....			4
Lawrence.....			6	Canton.....			11
Leeds.....			5	Columbus.....			6
Leominster.....			6	Corinth.....			4
Long Plain.....			5	Duck Hill.....			5
Ludlow Center.....			5	Edwards.....			5
Lynn.....			6	Fayette.....			14
Mansfield.....			6	Greenville.....			4
Milton.....			6	Hattiesburg.....			12
Monroe.....			4	Hazlehurst.....			7
Monson.....			5	Hernando.....			6
Mount Nonotuck.....			5	Kosciusko.....			6
Mystic Lake.....			5	Lake.....			6
Nantucket.....			5	Leakesville.....			6
Natick.....			6	Logtown.....			6
New Bedford.....			6	Moss Point.....			11
North Billerica.....			6	Natchez.....			12
Plymouth.....			7	Okolona.....			4
Provincetown.....			6	Pontotoc.....			17
Randolph.....			6	Port Gibson.....			7
Roxbury.....			6	Stonington.....			4
Salem.....			6	Thornton.....			12
Salisbury.....			6	Topton.....			6
Somerset.....			6	University.....			6
Taunton.....			6	Vicksburg.....			11
Wakefield.....			6	Water Valley.....			4
Webster.....			5	Waynesboro.....			5
Wellesley.....			5	Woodville.....			11
Westboro.....			5	<i>Missouri.</i>			
Williamstown.....			5	Boonville.....			16
Winchendon.....			5	Brunswick.....			16
Winchester.....			5	Carrollton.....			16
Worcester.....			5	Columbia.....			16
<i>Michigan.</i>				Downing.....			10
Adrain.....			5	East Lynn.....			16
Albion.....			5	Edgehill.....			3
Allegan.....			5	Eldon.....			11
Alma.....			5	Emma.....			5
Arbela.....			5	Fairport.....			16
Ball Mountain.....			5	Farmersville.....			16
Berlin.....			5	Gallatin.....			7
Berrien Springs.....			5	Hannibal.....			10
Birmingham.....			5	Houstonia (near).....			17
Bronson.....			5	Ironton.....			10
Charlevoix.....			5	Kansas City.....			13
Cheboygan.....			5	Kidder.....			16
Clinton.....			5	Lamonte.....			16
Detroit.....			5	La Plata.....			16
Fitchburg.....			5	Louisiana Bridge.....			11
Flint.....			5	McCune.....			16
Gladwin.....			5	Marceline.....			16
Grand Rapids.....			5	Marshall.....			10
Grape.....			5	Miami.....			16
Hanover.....			5	Nevada.....			16
Harbor Springs.....			5	New Hartford.....			10
Harrison.....			5	New Madrid.....			3
Harrisville.....			5	New Palestine.....			16
Hart.....			5	Oak Ridge.....			6
Howell.....			5	Potosi.....			10
Ivan.....			5	St. Charles.....			10
Jeddo.....			5	St. Louis.....			10
Kalamazoo.....			5	Sedalia.....			16
Lake City.....			5	Steffenville.....			9
Lansing.....			5	Stellada.....			16
Lathrop.....			5	Vermont.....			3

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Missouri—Cont'd.</i>				<i>North Carolina.</i>			
Warrensburg.....			16	Asheville.....			11
<i>Montana.</i>				Auburn.....		13	
Columbia Falls.....			16	Bailey.....			11
Glasgow.....			9	Bakersville.....			11
<i>Nebraska.</i>				Blowing Rock.....			10
Alliance.....			16	Chapel Hill.....		6	
Chadron.....			15	Charlotte.....		7	
Cornelia.....			15	Falkland.....		7	
Ewing.....			15	Fayetteville.....		7	
Gering.....			15	Flat Rock.....			11
Holdrege.....			15	Goldstboro f.....		7	
Indianola.....			16	Greensboro f.....		11	
Lexington.....			15	Highlands.....		10	
Lodge Pole.....			15	Horse Cove.....		11	
Lynch.....			11	Littleton f.....		6	
Marquette.....			16	Louisburg f.....		7	
Oakdale.....			15	Lumberton f.....		7	
Ogallala.....			15	Lynn f.....		7	
Ravenna.....			15	Marion f.....		6	
Santee Agency.....			1	Mocksville.....		11	
Wallace.....			15	Monrovia.....		7	
<i>Nevada.</i>				Murphy.....		11	
Crane Ranch.....			28	Newbern f.....		7	
<i>New Hampshire.</i>				Oak Ridge.....		11	
Alstead.....			5	Raleigh.....		11	
Brookline.....			5	Rockingham.....		7	
Concord.....			5	Roxboro.....		11	
Dublin.....			5	Shelby.....		11	
Grafton.....			5	Skyuka.....		6	
Hanover.....			5	Sloan.....		7	
Keene.....			6	Soapstone Mount.....		10	
Lancaster.....			5	Southern Pinea.....		7	
Newton.....			5	Waynesville.....		10	
North Conway.....			5	Weldon.....		11	
Peterboro.....			5	Wilmington.....		7	
Plymouth.....			5	<i>North Dakota.</i>			
Sanborn.....			5	Ashley.....		9	
<i>New Jersey.</i>				Grafton.....		8	
Asbury Park.....			9	Lemert.....		19	
Atlantic City.....			7	Minto.....		1	
Barnegat f.....			7	Oakdale.....		28	
Bayonne.....			9	St. John.....		9	
Beach Haven f.....			7	<i>Ohio.</i>			
Belvidere.....			8	Annapolis.....		5	
Bridgeton.....			12	Arcanum.....		5	
Camden.....			7	Ashland.....		52	
Cape May.....			13	Athens.....		6	
Charlotteburg.....			8	Atwater.....		6	
Deckertown f.....			6	Auburn.....		6	
Dover.....			8	Bellefontaine.....		6	
Franklin Furnace.....			8	Bement.....		5	
Freehold.....			9	Benton Ridge.....		5	
Gillette.....			8	Big Prairie.....		6	
Hightstown f.....			7	Binola.....		5	
Imlaystown.....			6	Bladensburg.....		6	
Junction.....			8	Bloomington.....		7	
Lambertville f.....			7	Bloomington.....		7	
Moorestown.....			7	Bowling Green.....		7	
Newark.....			6	Bucyrus.....		6	
New Brunswick.....			8	Caledonia.....		10	
Newton.....			7	Cambridge.....		6	
Ocean City.....			7	Camp Dennison.....		10	
Oceanic.....			30	Canal Dover.....		4	
Paterson.....			6	Canton.....		7	
Pensauken.....			7	Carrollton.....		6	
Perth Amboy.....			11	Cedarville.....		11	
Plainfield.....			9	Celina.....		5	
Readington f.....			5	Cherry Fork.....		5	
River Vale f.....			9	Cincinnati.....		9	
Somerville.....			7	Circleville.....		6	
South Orange.....			8	Clarksville.....		7	
Tenafly.....			29	Clifton.....		7	
Trenton f.....			7	Coalton.....		10	
Whiting f.....			7	Columbia.....		6	
<i>New Mexico.</i>				Cynthiana.....		9	
Chama.....			1	Dayton.....		7	
Ciruella.....			15	Defiance.....		5	
Eddy f.....			11	Demose.....		5	
Sulphur Hot Springs.....			28	Dupont.....		12	
<i>New York.</i>				Ellsworth.....		5	
Baldwinsville.....			5	Elyria.....		5	
Bedford.....			5	Fayetteville.....		5	
Cooperstown.....			5	Findlay.....		5	
Fleming.....			8	Fosteria.....		5	
Glens Falls.....			5	Georgetown.....		10	
Hamilton.....			5	Gratiot.....		6	
Honeymoon Brook.....			5	Greenfield.....		8	
Marlboro.....			6	Greenville.....		8	
Middletown.....			9	Hackney.....		13	
New York.....			7	Hanging Rock.....		10	
Ogdensburg.....			4	Harbor.....		10	
Oneonta.....			4	Hedges.....		7	
Oswego.....			2	Hillhouse.....		5	
Oxford.....			7	Hillhouse.....		10	
Palermo.....			10	Jacksonboro.....		7	
Port Jervis.....			8	Kenton.....		5	
Poughkeepsie.....			8	Kilbourne.....		5	
Seton.....			9	Killbuck.....		6	
Stillwater.....			5	Levering.....		5	
Wappingers Falls.....			5	Logan.....		11	
West Chazy.....			5				

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
<i>Ohio—Cont'd.</i>				<i>Pennsylvania—Cont'd.</i>			
Lordstown.....			5	Philadelphia.....		7	9
McArthur.....			7	Phoenixville.....			9
McConnellsville.....			6	Quakertown.....			7
Mansfield.....			6	Salem Corners.....			5
Marietta.....			13	Selinsgrove.....			8
Millfordton.....			7	Somerset.....			7
Milligan.....			6	South Eaton.....			8
Millport.....			6	Stoyestown.....			7
Montpelier.....			7	Uniontown.....			6
Napoleon.....			7	Warren.....			8
New Alexandria.....			6	Wellsville.....			7
New Berlin.....			3	West Newton.....			7
New Bremen.....			3	Westtown.....			9
New Comerstown.....			3	Wilkesbarre.....			6
New Holland.....			3	<i>Rhode Island.</i>			
New Waterford.....			3	Block Island.....		6	30
North Fairfield.....			7	Bristol.....		7	5
North Lewisburg.....			8	Kingston.....			6
North Royalton.....			6	Lonsdale.....			6
Northwood.....			6	Newport f.....			6
Norwalk.....			6	Pawtucket f.....			5
Oberlin.....			6	Providence.....			5
Ohio State University.....			7	<i>South Carolina.</i>			
Orangeville.....			6	Aiken f.....		11	
Ottawa.....			7	Allendale f.....		7	
Pataskala.....			5	Batesville.....		11	
Plattsburg.....			7	Blackville.....		11	
Pomeroy.....			5	Blenheim.....		17	
Portsmouth.....			7	Branchville.....		1	
Ridge.....			7	Central.....			13
Ridgeville Corners.....			9	Charleston.....		6	11
Ripley.....			7	Cheraw.....		6	
Rittman.....			7	Columbia.....		7	
Rocky Ridge.....			7	Cross Hill.....		6	
Sharon Center.....			6	Flint Hill.....		1	7
Shenandoah.....			8	Florence.....		7	
Sidney.....			8	Georgetown f.....		10	
Springboro.....			11	Greenville f.....		9	
Stoutsville.....			7	Greenwood f.....		11	
Sylvania.....			14	Hardeeville.....		7	
Thurman.....			7	Holland.....		7	
Toledo.....			6	Kingsree f.....		11	
Upper Sandusky.....			6	Little Mountain.....		11	
Vanceburg.....			10	McCormick.....		6	
Vermilion.....			7	Pinopolis.....		7	
Vicksburg.....			6	Port Royal.....		7	12
Waraw.....			5	St. George f.....		7	
Waynesville.....			7	St. Matthews f.....		12	
Wellington.....			10	Santuck.....		1	6
Westerville.....			7	Society Hill.....		6	
Weymouth.....			6	Spartanburg f.....		16	
Wheeler.....			6	Statesburg.....		6	
Willoughby.....			6	Trenton.....		7	
Wooster.....			6	Triant.....		6	
Zanesville.....			6	Watts.....		6	
<i>Oklahoma.</i>				Yorkville.....		6	
Fort Reno f.....			11	<i>South Dakota.</i>			
Guthrie.....			5	Forestburg.....			11
Norman.....			5	Parkston.....			6
Ponca f.....			4	Tyndall.....			1
<i>Oregon.</i>				Wessington Springs.....			1
Albany.....			16	<i>Tennessee.</i>			
Astoria.....			4	Andersonville.....		1	11
Aurora.....			16	Arlington f.....		3	
Bay City.....			16	Bolivar f.....		3	
Eugene.....			5	Bristol f.....		4	5
Jacksonville.....			16	Brownsville f.....		6	
La Grande.....			23	Byrdstown.....			10
Lakeview f.....			1	Chattanooga.....			11
Langlois.....			16	Covington.....			3
McMinnville.....			21	Dyersburg f.....			11
Mount Angel.....			4	Florence.....			11
Portland.....			16	Franklin.....			11
Roseburg.....			16	Greenville.....			11
Springbrook.....			16	Hohenwald.....			11
<i>Pennsylvania.</i>				Jacksboro.....			10
Aqueduct.....			13	Jackson f.....			3
Beaver Dam.....			6	Lynnville.....			11
Bethlehem.....			8	Memphis.....			3
Brookville.....			8	Nashville.....			11
Carlisle.....			13	Newport.....			11
Coatesville.....			9	Parkville f.....			6
Confluence.....			7	Riddletown.....			10
Coopersburg.....			6	Rogersville.....			6
Davis Island Dam.....			13	South Bethlehem.....			11
Drifton.....			8	Springdale.....			11
East Mauch Chunk.....			8	Trenton f.....			3
Easton.....			7	Tullahoma.....			11
Erie.....			6	<i>Texas.</i>			
Frederick.....			7	Abilene f.....			17
Greensboro.....			6	Albany f.....			11
Hamburg.....			10	Arlington f.....			6
Honesdale.....			7	Aurora f.....			11
Lebanon.....			7	Austin f.....			17
Lewisburg.....			8	Belton f.....			17
Lock Haven.....			12	Boerne.....			17
Lock No. 4.....			8	Brady.....			6
Lycippus.....			10	Brigham.....			15
Mahoning.....			12	Burnett f.....			17
				Coleman f.....			17
				College Station.....			17
				Corsicana f.....			11

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Texas—Cont'd.				Virginia—Cont'd.			
Dallas	17			Avon	4	11	
Duval	17			Bedford	7	11	
Fort Worth	17			Birdnest		12	
Fredericksburg	6			Blacksburg		5	
Graham	3			Buckingham		11	
Grape Vine	6			Dale Enterprise		6	
Hallettsville	20			Grahams Forge	11	5	
Hearne	17			Hampton	7		
Huntsville	16			Irwin		12	
Lampasas	19			Lexington		5	
Llano	17			Lynchburg	11	11	
Longview	17			Petersburg		11	
Luling	20			Richmond		11	
Marshall	12			Rocky Mount		6	
Mountain Spring	17			Salem		3	
New Braunfels	20			Smithville	11	5	
Palestine	11			Spottsville		6	
Paris	11			Staunton		6	
Rocksprings	16			Warsaw		7	
Round Rock	20			Whittles Depot		11	
San Marcos	7			Wytheville		5	
Silver Falls	5						
Temple	11			Washington.			
Tyler	6			Aberdeen		15	
Waco	17			Blaine		17	
Weatherford	11			Bridgeport		22	
Wichita Falls	11			Colfax		22	
Vermont.				Concord		23	
Cornwall			5	Ellensburg		23	
Hartland			5	Fort Canby	4	16	
Irassburg			5	Fort Simcoe		23	
Jacksonville			5	Fort Spokane		23	
Norwich			5	Hunters		16	
Vernon			5	Lakeside		22	
Wells			5	Moxee Valley		22	
Virginia.				Neah Bay	15		
Alexandria	6			Port Angeles	16		
Ashland			11	Rosalie		21	
				Seattle	15	16	

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Washington—Cont'd.				Wisconsin—Cont'd.			
Spokane			23	City Point			3
Tatoosh Island	16			Columbus			7
West Ferndale			16	Crandon			1
West Virginia.				Delavan			7
Bloomery			6	Depere			5
Burlington			6	Eau Claire			3
Charleston			10	Florence			2
Creston			6	Fond du Lac			7
Elkhorn			5	Hartford			7
Ella			5	Harvey			7
Fairmont			6	Hayward			6
Glenville			6	Hillsboro			2
Grafton			6	Janesville			7
Madison			6	La Crosse			2
Marlinton			5	Lancaster			4
Morgantown			5	Lincoln			7
New Cumberland			5	Madison			7
Parkersburg			5	Manitowoc			7
Philippi			6	Meadow Valley			7
Point Pleasant			10	Menomonie			2
Powellton			5	Milwaukee			7
Raleigh			5	Neillsville			9
Rowlesburg			6	Oconto			7
Spencer			6	Oshkosh			7
Weston			5	Pepin			1
Wheeling			6	Portage			7
Wisconsin.				Port Washington			7
Amherst			7	Prairie du Chien			7
Antigo			2	Reedsburg			7
Ashland			2	Royalton			7
Baraboo			7	Shawano			6
Barron			3	Spooner			3
Bayfield			8	Stevens Point			3
Beaver Dam			4	Valley Junction			7
Beloit			7	Viroqua			2
Black River Falls			7	Watertown			7
Centralia			6	Waukesha			7
Chippewa Falls			4	Westfield			7
				Weston			3

HUMIDITY.

WET-BULB OR SENSIBLE TEMPERATURES.

The sensation of heat experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but especially upon its dryness and the force of the wind. Physiologists have explained this nervous sensation, erroneously called subjective temperature, as a condition due to the more or less rapid evaporation of the natural perspiration and the consequent drying of the outer layers of the skin.

Investigations were made into the relations between the moisture of the air and its physiological effects by Mr. J. W. Osborne, of Washington (see the Proceedings of the American Association for the Advancement of Science, 1876), and especially by the Chief of the Weather Bureau (see his memoir on "Sensible Temperatures," read before the American Climatological Association, June 1, 1894). It would seem that the rapid evaporation from the skin in dry, hot weather reduces the temperature of the layer of nerve cells at the surface of the skin. This reduction is not measurable by thermometers which give the temperature of large masses, but is appreciated by the minute nerves that end in these microscopic cells.

The reduction of temperature, or sensible coolness, is apparently proportional to the difference between the dry and wet bulb thermometers, and as shown by the chart accompanying Professor Harrington's memoir, it amounts on the average to 20° in the month of July in Arizona, Nevada, and Utah and 10° in Kentucky, Indiana, and Ohio. The resulting sensible temperatures, as shown on his second chart, are simply the so-called average temperatures of the wet-bulb thermometer in the shaded shelter, and correspond to the temperatures of persons standing in the shade of trees or

houses, exposed to a natural breeze of at least 6 miles per hour, as obtained by the whirling apparatus used with the wet-bulb thermometer. The temperature of the wet-bulb thermometer and its depression below the dry bulb are the fundamental data for all investigations into the relation between human physiology and the atmosphere. In order to present a monthly summary of the atmospheric conditions from a hygienic and physiological point of view, Table Ia has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

HUMIDITY.

The quantity of moisture in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air. This is usually known as the absolute measure and is equivalent to giving the tension or pressure of the vapor, or the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I. These vapor pressures and the resulting dew-points, absolute humidities, and relative humidities are all deduced from observations of the wet-bulb thermometer by means of formulæ and tables that were first devised by August and subsequently modified by Regnault, 1845, and Ferrel in 1885, but which are still considered to be open to further improvement. In a general way the dew-points given in Table I are probably slightly lower than they should be, owing to the omission since 1887 of a correction for barometric pressure. There is also an uncertainty in the psychrometric formula which is only just now beginning to be understood, by virtue of which at temperatures below freezing the dew-points and the humidities are higher than they should be. For these reasons

the monthly averages of the dew-points and relative humidities are subject to some uncertainty.

AVERAGE HUMIDITY.

The temperature of the wet bulb of the psychrometer is the temperature at which evaporation is going on from a special surface of water on muslin at any moment, but a properly constructed evaporimeter may be made to give us the quantity of water evaporated from a similar surface during any interval of time. Such an evaporimeter, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this evapora-

tion the average humidity of the air during any given interval of time may be deduced. Instead of attempting to make a self-registering wet-bulb thermometer we may use the evaporimeter as an equivalent. A formula for determining the average vapor tension during an hour was given in 1887, at page 376 of the Treatise on Meteorological Apparatus and Methods (in the section on the use of the evaporimeter as an integrating hygrometer), as based on the careful measurements made by Mr. Desmond Fitzgerald and published in the Transactions of the American Society of Civil Engineers, 1886.

PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation for the month of November, 1894, as determined by reports from about 2,000 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III; the first of these also gives the average departures from the normal for each district, whereas the average departure for each State is given in Table XII for each State Weather Service.

DIURNAL VARIATION.

Table IVb gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 6 are weighing gauges.

NORMAL PRECIPITATION FOR NOVEMBER.

The normal precipitation for November is shown on Chart IX of the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, Compiled to the End of 1891, with Annual, Seasonal, Monthly, and other Charts," by Mark W. Harrington, Chief of the Weather Bureau, Washington, 1894. From this chart it appears that the region of greatest rainfall in November is from 5 to 12 inches along the coast of Washington and Oregon. The rainfall averages from 3 to 5 inches through central Oregon and Washington, northern and central California, and about 4 inches from the Gulf coast to New England.

PRECIPITATION FOR CURRENT MONTH.

The precipitation for the current November was heaviest in the extreme northwest corner of Washington; the maximum was 13.7 at Tatoosh Island and 14.7 at Neah Bay. The region of no apparent rain or snow covered southern California and Nevada, Utah, Arizona, New Mexico, and western Texas.

CURRENT DEPARTURES FROM NORMAL PRECIPITATION.

The precipitation for November was deficient over the whole of the middle and southern portions of the United States. There was an excess in Prince Edward Island and Nova Scotia, on the coasts of New York, New Jersey, Connecticut, and Rhode Island, on the coast of Washington, and along a belt covering Canada and the extreme northern part of the United States; also in a small region along the coast of Georgia and Florida and in middle Florida.

The principal departures from the normal at Weather Bureau stations were as follows:

Excesses: Sault Ste. Marie, 2.6; Tatoosh Island, 2.5; Olympia, 2.2; Marquette, 2.1; Port Angeles, 2.0; Neah Bay, 1.8; Fort Canby and Savannah, 1.7; Jacksonville, 1.1.

Deficits: Springfield, Mo., 6.8; Little Rock, 4.9; Memphis, 4.3; Mobile, 3.9; Pensacola, 3.7; Louisville, 3.4; Portland, Oreg., 3.3; Atlanta, New Orleans, and Corpus Christi, 3.1; Galveston, 3.0.

Considered by districts, the precipitation for November,

1894, when compared with the normal for the month, furnishes the departures given in Table I, as expressed in inches. By dividing those departures by the normal precipitation for November, we obtain the following corresponding percentages (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: North Pacific, 106; North Dakota (extreme northwest), 100.

Below the normal: New England, 93; middle Atlantic, 63; south Atlantic, 78; Key West, 39; east Gulf, 24; west Gulf, 28; Ohio Valley and Tennessee, 34; lower Lake, 53; upper Lake, 96; upper Mississippi, 60; Missouri Valley, 46; northern slope, 59; middle slope, 12; middle plateau, 13; northern plateau, 62; northern Pacific, 40; southern Pacific, 15.

Normal: Southern slope (Abilene) and southern plateau.

For certain voluntary stations of rather long periods of observation the normal and extreme monthly precipitations and the departures are shown in detail in Table Xb, which is now placed among the meteorological tables instead of being inserted in the text as heretofore.

YEARS OF GREATEST PRECIPITATION FOR NOVEMBER.

The precipitation for the current month was not the greatest on record for the month of November at any regular Weather Bureau station.

YEARS OF LEAST PRECIPITATION FOR NOVEMBER.

The precipitation for the current month was the least on record for the month of November at regular Weather Bureau stations, as shown in the following table:

Station.	Current precipitation.		Previous minimum.	
	Amount.	Departure.	Amount.	Year.
Alpena, Mich.....	1.41	- 1.5	1.43	1891
Buffalo, N. Y.....	1.82	- 1.8	2.09	1875
Erie, Pa.....	1.90	- 2.5	1.97	1893
Cincinnati, Ohio.....	0.98	- 2.4	1.22	1872
Memphis, Tenn.....	0.49	- 4.3	0.90	1876
Little Rock, Ark.....	0.63	- 4.9	2.64	1885
Shreveport, La.....	0.87	- 4.0	1.39	1872
Wichita, Kans.....	0.24	- 1.0	0.24	1892
Topeka, Kans.....	0.35	- 1.2	0.60	1892
Concordia, Kans.....	0.02	- 1.4	0.20	1891
North Platte, Nebr.....	0.01	- 0.4	0.01	1882
Pueblo, Colo.....	0.06	- 0.2	0.06	1893
Abilene, Tex.....	T.	- 2.7	0.12	1891
Corpus Christi, Tex.....	0.01	- 3.0	0.37	1890
El Paso, Tex.....	0.00	- 0.6	T.	1891
Tucson, Ariz.....	0.00	- 0.5	0.00	"
Yuma, Ariz.....	0.00	- 0.3	0.00	"
San Diego, Cal.....	0.00	- 0.8	0.00	"
Los Angeles, Cal.....	0.00	- 1.5	0.00	"

* Frequently.

ACCUMULATED PRECIPITATION.

The total accumulated monthly departures from normal precipitation from the beginning of the year to the end of the current month are given in the second column of the fol-

lowing table; the third column gives the ratio of the current accumulated precipitation to its normal value:

District.	Accumulated departure.	Accumulated precipitation.	District.	Accumulated departure.	Accumulated precipitation.
	Inch.	Per ct.		Inch.	Per ct.
New England	8.90	79	Key West.....	3.60	109
Middle Atlantic.....	5.40	87	Middle slope	0.40	102
South Atlantic.....	2.50	95	Northern plateau.....	2.30	114
East Gulf.....	7.90	85	North Pacific	14.80	129
West Gulf.....	5.20	88			
Ohio Valley and Tennessee	11.40	74			
Lower Lake.....	5.10	85			
Upper Lake.....	1.50	95			
North Dakota (Ex. N.W.)..	0.10	99			
Upper Mississippi.....	11.70	66			
Missouri Valley.....	8.44	72			
Northern slope	1.20	91			
Southern slope (Abilene)..	2.90	89			
Southern plateau.....	4.20	61			
Middle plateau.....	0.20	98			
Middle Pacific	2.80	88			
South Pacific.....	5.50	48			

EXCESSIVE PRECIPITATION.

The following table for November, 1894, shows, by States, the individual stations reporting total precipitation to equal or exceed 10.00 inches during this month, 2.50 in 24 hours, and 1.00 in 1 hour:

Excessive precipitation, by stations, for November, 1894.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Arkansas.	Inches.	Inches.		Inches.	A. m.	
Kirby	2.55	1				
Connecticut.						
Middletown	2.74	5				
New London	2.54	5-6				
Florida.						
Archer	4.50	3				
Federal Point	5.90	2-3				
Gainesville	3.95	2-3				
Green Cove Springs	4.45	2				
Jacksonville	2.81	2-3				
Merritts Island	2.80	18				
St. Francis Barracks	6.20	2-4				
Georgia.						
Albany	3.80	2				
Fort Gaines			2.02	1 00	23	
Quitman	2.60	20				
Massachusetts.						
Plymouth	2.50	5-6				
Taunton	3.68	5-6				
Vineyard Haven	3.90	5-6				
Mississippi.						
Pontotoc			1.29	0 30	16	
Vicksburg			1.50	1 00	23	
New Jersey.						
Tenafly	2.78	5				
New York.						
Setanket	3.08	5				
Oregon.						
Glenora	13.81	5.30	24-25			
South Carolina.						
Cross Hill	2.62	2				
Pinopolis	2.76	2-3				
Tennessee.						
Nunnally			1.79	1 30	16	
Texas.						
Brasoria			1.42	1 15	2	
Orange			1.00	0 10	1	
Washington.						
Aberdeen	10.84					
Cascade Tunnel	15.46					
East Clallam	10.99	2.85	24			
Index	16.61					
Neah Bay	14.76					
Pysh	2.92	24				
Stampede	10.36					
Tatoosh Island	13.71					
Union City	10.28					

The following tables give a summary of the preceding table and show the number of stations in each State reporting excessive precipitation during this month:

Monthly precipitation to equal or exceed 10.00 inches.

State.	Number of stations.	State.	Number of stations.
Washington	8	Oregon	1

Daily precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Florida	7	2, 2-3, 2-4, 3, 18.	Washington	2	24.
Massachusetts	3	5-6.	Arkansas	1	1.
Connecticut	3	5, 5-6.	Oregon	1	5.
Georgia	2	2, 20.	New Jersey	1	5.
South Carolina	2	2, 2-3.	New York	1	24-25.

Hourly precipitation to equal or exceed 1.00 inch.

Mississippi	2	16, 23.	Georgia	1	23.
Texas	2	1, 2.	Tennessee	1	16.

FREQUENCY OF EXCESSIVE PRECIPITATION.

The following tables show the frequency of excessive precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several States and Territories for November during the last twenty-five years:

Frequency of excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
Washington	15	New Jersey	2
Oregon	12	Tennessee	2
California	7	Alabama	1
Maryland	4	Colorado	1
Texas	4	Connecticut	1
Mississippi	4	Delaware	1
North Carolina	4	Georgia	1
Louisiana	3	Kansas	1
Arkansas	3	Michigan	1
Massachusetts	3	Pennsylvania	1
New York	3	Wisconsin	1
Florida	2	Illinois	1
Indiana	2	Kentucky	1
New Hampshire	2		

Frequency of excessive daily precipitation.

Louisiana	19	Iowa	6
Texas	19	Kansas	6
North Carolina	18	New Hampshire	6
Alabama	14	Michigan	6
Tennessee	14	Ohio	6
Massachusetts	13	Kentucky	5
Georgia	13	Rhode Island	4
Mississippi	12	Maryland	4
Florida	12	Virginia	4
New York	11	Wisconsin	3
Illinois	10	West Virginia	3
Arkansas	10	Colorado	3
Oregon	10	Delaware	2
Indiana	9	Indian Territory	2
Missouri	9	Vermont	2
Connecticut	9	Arizona	1
South Carolina	9	North and South Dakota	1
Washington	9	District of Columbia	1
New Jersey	8	Minnesota	1
Maine	7	Nebraska	1
Pennsylvania	7	New Mexico	1
California	7		

Frequency of excessive hourly precipitation.

Texas	10	District of Columbia	1
Mississippi	5	Kansas	1
Florida	4	Kentucky	1
Tennessee	4	Michigan	1
North Carolina	3	Nebraska	1
Georgia	3	New York	1
California	2	Pennsylvania	1
Indiana	2	Virginia	1
Alabama	2	West Virginia	1
South Carolina	2	Louisiana	1

EXCEPTIONAL PRECIPITATION.

The following tables give exceptionally heavy monthly, daily, and hourly precipitations reported for November, by any station, regular or voluntary, and in any year since 1871:

Exceptional monthly precipitation.

Station and state.	Amt.	Year.	Station and state.	Amt.	Year.
	Inches.			Inches.	
Glenora, Oreg.	34.88	1893	Neah Bay, Wash.	23.06	1891
Crescent City, Cal.	31.93	1885	Fort Stevens, Oreg.	22.21	1877
Delta, Cal.	29.38	1885	Point Pleasant, La.	20.89	1877
Glenora, Oreg.	25.56	1892	Neah Bay, Wash.	20.61	1892
Fort Gaston, Cal.	24.54	1885	Aberdeen, Wash.	20.46	1892
Georgetown, Cal.	24.12	1873	Langlois, Oreg.	20.42	1893
Edmonton, Cal.	23.09	1892			

Exceptional daily precipitation.

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Edmonton, Cal.	14.50	28-30, 1892	Charleston, S. C.	5.84	16-17, 1889
Middletown, Cal.	14.10	26-30, 1892	Thatchers Island, Mass.	5.75	18-19, 1878
Los Gatos, Cal.	13.16	27-30, 1892	Birdsnest, Va.	5.75	7-9, 1893
Cloverdale, Cal.	11.86	27-30, 1892	Cheneyville, La.	5.70	9, 1891
Georgetown, Cal.	11.08	28-30, 1892	Galveston, Tex.	5.63	6, 1872
Glenora, Oreg.	10.40	7-8, 1893	Payette, Miss.	5.60	27-28, 1880
Fort Barrancas, Fla.	10.39	26, 1878	Hampton, Va.	5.53	7-9, 1893
San Luis Obispo, Cal.	10.04	17-18, 1885	Wellshoro, Pa.	5.50	23, 1884
Placerville, Cal.	9.92	28-30, 1892	Norfolk, Va.	5.48	8-9, 1893
Susanville, Cal.	8.91	28-30, 1892	Boston, Mass.	5.43	20-21, 1876
Bluff Settlement, Tex.	8.00	14-16, 1874	East Clallam, Wash.	5.41	17-19, 1892
Cheneyville, La.	7.91	15-16, 1890	Barnegat City, N. J.	5.33	24-25, 1877
Dover, Del.	7.58	18-20, 1876	Glenora, Oreg.	5.30	24-25, 1894
Langlois, Oreg.	7.30	28-29, 1893	Saluda, Va.	5.26	8-9, 1893
Point Pleasant, La.	7.10	20, 1877	Linnville, N. C.	5.25	9-10, 1891
Marion, Ala.	7.00	6-7, 1885	Ft. Independence, Mass.	5.25	21-22, 1874
Melissa, Tex.	7.00	1, 1877	Newport, Mich.	5.25	24-25, 1884
Belmont Farm, Tex.	7.00	1, 1877	Spotsville, Va.	5.24	7-9, 1893
Point Pleasant, La.	6.80	8, 1877	Shasta Springs, Cal.	5.21	27-28, 1893
Quitman, Ga.	6.70	5-6, 1880	Charleston, Ill.	5.21	26-27, 1887
Glenora, Oreg.	6.56	23-24, 1893	Nevada City, Cal.	5.20	30, 1892
Brenham, Tex.	6.45	25-26, 1893	Okaloosa, La.	5.20	9, 1879
Milton, Mass.	6.20	25-27, 1888	Palermo, Cal.	5.16	29-30, 1892
St. Francis B'ks, Fla.	6.20	2-4, 1894	Mattoon, Ill.	5.11	26, 1887
Hatteras, N. C.	6.16	7-8, 1893	Camden, Ala.	5.14	31-1, 1892
Booneville, Miss.	6.12	21-22, 1891	Camden, Ala.	5.10	31-1, 1892
Cape Henry, Va.	6.08	7-9, 1893	Dyersburg, Tenn.	5.10	16, 1891
Fort Barrancas, Fla.	6.07	16, 1881	Franklin, La.	5.09	18-19, 1893
Point Pleasant, La.	6.03	11-12, 1881	Palestine, Tex.	5.05	10, 1883
Greensboro, Ala.	6.00	6-7, 1885	White Plains, N. Y.	5.04	27-28, 1890
Oleta, Cal.	5.95	29-30, 1892	Lake Charles, La.	5.00	16, 1890
Red Bluff, Cal.	5.93	8-9, 1885	Sandy Spring, Md.	5.00	23-24, 1877
Upper Mattole, Cal.	5.93	26-28, 1893	Vandalia, Ill.	5.00	26, 1877
Cape Charles, Va.	5.92	7-8, 1893	Ellsworth, N. C.	5.00	28, 1880
Federal Point, Fla.	5.90	2-3, 1894	Reidsville, N. C.	5.00	7-8, 1885

*October 31 to November 1, 1892.

Exceptional precipitation for one hour or less.

Station and state.	Amount.	Time.	Date.
	Inches.	H. M.	
New York, N. Y.	0.25	0 02	18, 1886
Nashville, Tenn.	0.25	0 03	16, 1894
Savannah, Ga.	0.25	0 03	24, 1894
Wilmington, N. C.	0.25	0 03	2, 1894
Galveston, Tex.	0.35	0 03	18, 1893
New Orleans, La.	0.35	0 03	21, 1893
Jupiter, Fla.	0.34	0 03	4, 1893
Savannah, Ga.	0.25	0 03	27, 1893
Galveston, Tex.	0.25	0 03	6, 1892
Tampa, Fla.	0.25	0 03	27, 1893
Memphis, Tenn.	0.40	0 05	16, 1890
Washington, D. C.	0.35	0 05	23, 1891
Jupiter, Fla.	0.30	0 05	29, 1890
Orange, Tex.	1.00	0 10	1, 1894
Jupiter, Fla.	0.68	0 10	4, 1893
New Orleans, La.	0.64	0 10	21, 1893
Galveston, Tex.	1.48	0 15	5, 1877
Vicksburg, Miss.	1.82	0 20	15, 1879
Logtown, Miss.	3.10	0 30	1, 1892
Hallettsville, Tex.	1.60	0 30	8, 1891
Jupiter, Tex.	3.50	0 51	4, 1893

*Record incomplete.

MAXIMUM RAINFALL FROM SELF-REGISTERING GAUGES.

The following table gives the heaviest rainfall during November, 1894, for periods of 5, 10, and 60 minutes, as recorded on self-registering rain gauges at regular stations of the Weather Bureau. This record refers strictly to rain-

fall. About 37 stations are furnished with self-registering float rain gauges and 6 with the self-registering-weighing rain-and-snow gauge. The float gauge does not record snowfall, and both forms are liable to be interrupted by snow or ice:

Maximum rainfall in one hour or less.

Station.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Atlanta, Ga.	0.06	23	0.06	13, 23	0.25	23
Baltimore, Md.	0.03	21	0.06	21	0.15	21
Bismarck, N. Dak.	0.02	6	0.03	6	0.09	6
Boston, Mass.	0.04	3	0.08	3	0.28	3
Buffalo, N. Y.	0.07	12	0.10	12	0.21	12
Chicago, Ill.	0.03	8	0.05	8	0.10	2
Cincinnati, Ohio.	0.02	2	0.03	2	1.12	2
Cleveland, Ohio.						
Denver, Colo.						
Detroit, Mich.						
Dodge City, Kans.						
Duluth, Minn.						
Eastport, Me.						
Galveston, Tex.	0.18	19, 22	0.05	19, 22	0.20	22
Indianapolis, Ind.	0.03	2	0.05	2	0.86	2
Jacksonville, Fla.	0.21	2	0.23	2	0.12	29
Jupiter, Fla.	0.20	1	0.28	22	0.45	3
Kansas City, Mo.	0.15	1	0.25	1	0.71	22
Key West, Fla.	0.17	21	0.18	21	0.26	21
Louisville	0.05	2	0.06	2	0.12	2
Marquette, Mich.	0.05	2	0.07	2	0.21	2
Memphis, Tenn.	0.10	23	0.11	23	0.25	23
Milwaukee, Wis.	0.05	2	0.06	2	0.19	2
Nantucket, Mass.	0.16	5	0.25	5	0.41	5
Nashville, Tenn.	0.25	16	0.40	16	0.78	16
New Orleans, La.						
New York, N. Y.	0.18	3	0.22	3	0.63	3
Norfolk, Va.	0.07	3	0.10	3	0.30	3
Omaha, Neb.						
Philadelphia, Pa.	0.12	3	0.18	3	0.45	3
Pittsburg, Pa.	0.10	3	0.10	3	0.15	3
Portland, Me.	0.05	3, 10	0.08	3	0.21	3
Portland, Oreg.	0.01	2, 24	0.02	2, 24	0.12	24
Rochester, N. Y.	0.02	3	0.04	3	0.07	3
St. Louis, Mo.	0.05	2	0.09	2	0.18	2
St. Paul, Minn.	0.01	3	0.02	3	0.09	3
Salt Lake City, Utah						
San Diego, Cal.						
San Francisco, Cal.	0.07	27	0.13	27	0.46	27
Savannah, Ga.	0.25	24	0.37	24	0.54	20
Seattle, Wash.	0.05	25	0.08	25	0.32	28
Vicksburg, Miss.	0.21	23	0.39	23	1.50	23
Washington, D. C.	0.12	3	0.17	3	0.43	3
Wilmington, N. C.	0.25	2	0.33	2	0.43	2

*Record incomplete. †Less than 0.05 in 1 hour. ‡Record for 23 days only.

MONTHLY SNOWFALL.

The depth of snow that fell during the month of November, as reported by both regular and voluntary observers, is shown in detail, for stations reporting 5 inches or more, in the following table. The monthly snowfall and the limit of freezing weather are also shown on Chart VI.

DEPTH OF SNOW ON GROUND.

The depth of unmelted snow lying on the ground at 8 p. m. of the 15th and 30th is shown in the following table, for stations reporting 5 inches of monthly snowfall. The amount on the ground on the 30th is also shown on Chart VII.

Monthly snowfall and amounts on ground on the 15th and at close of month.

State and station.	Total.	15th.	30th.	State and station.	Total.	15th.	30th.
	Inches.	Inch.	Inch.		Inches.	Inch.	Inch.
California.				Connecticut—Cont'd.			
Bear Valley	8.5		4.0	Hartford	9.0	1.0	2.5
Boca	5.0			Middletown	8.0	T.	1.0
Cisco	15.0			New Hartford	6.8	1.0	0.0
Edmonton	12.0	0.0	8.0	New Haven	12.5	0.0	2.4
Emigrant Gap	9.0			N. Grosvener Dale	9.0		
Fordyce Dam	16.0			Norwalk	5.0		
La Porte	15.0		7.0	Southington	6.0		
Truckee	6.0			South Manchester	14.0	3.0	3.0
Colorado.				Storrs	7.0	1.0	2.0
Breckenridge	25.0	0.0	4.0	Voluntown	7.0		2.0
Climax	10.0			Wallingford	5.5		
Moraine	7.5	5.0		Waterbury	5.0	T.	
Ouray	11.2	3.0	1.0	West Simsbury	8.0	1.0	3.0
Red Cliff	7.5			Windsor	9.2	1.2	T.
Ruby	23.0	7.0	20.0	Idaho.			
Spring Gulch	7.2			Atlanta	15.0		6.0
Stamford	6.5			Kootenai	13.0	0.0	13.0
Sunnyside	5.2			Moscow	7.3		
Connecticut.				Murray	23.0		2.0
Canton	6.5	T.	1.5	Illinois.			
Colchester	8.0	T.	2.5	Aurora	5.6		
Falls Village	19.2	T.		Braidwood	5.1		

Monthly snowfall and amounts on ground, etc.—Continued.

State and station.	Total.	15th.	30th.	State and station.	Total.	15th.	30th.
Illinois—Cont'd.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	Michigan—Cont'd.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Riley	7.2			Northport	8.5	3.0	1.0
Winnebago	8.0			Old Mission	7.0	5.0	T.
Indiana.				Paris	11.5	4.0	2.0
Angola	14.0	14.0		Parkville	10.0		
Columbia City	10.5	1.0		St. Ignace	8.0	0.0	2.5
Delphi	5.5			St. Johns	5.8	2.0	0.0
Farmland	8.0			Sand Beach	7.0		
Hammond	13.0	2.0	0.0	Sault Ste. Marie	29.9	2.0	8.8
Huntingburg	10.2	0.0		Thornville	7.5	4.0	1.0
Plymouth	10.0	6.0		Vandalia	16.2		
South Bend	16.5	2.0		Minnesota.			
Valparaiso	20.0	10.0	0.0	Duluth	12.2	T.	T.
Iowa.				Farmington	6.0	0.0	0.0
Grand Meadow	5.0	1.0		Lake Winnibigoshish	7.0	1.3	
Maine.				Leech Lake	5.5		
Belfast	7.5			Marfield	5.0		
Calais	21.5	T.	1.5	Minnesota City	5.5	0.0	0.0
Cornish	15.0		4.0	Park Rapids	7.0	0.0	3.0
Eastport	7.3	0.0	T.	Pine River	5.6	3.5	1.0
Farmington	10.0			Pokegama Falls	9.4	0.0	2.0
Gardiner	5.0			St. Olaf	5.5	0.0	T.
Houlton	15.0			St. Vincent	6.2	0.0	3.0
Lewiston	7.6			Sandy Lake Dam	7.6	1.2	
Madison	8.0			Sauk Center	5.0	0.0	0.0
Mayfield	10.0	4.0	2.0	Two Harbors	13.5	1.0	1.0
Maryland.				Wabasha	6.0		
Oakland	9.2	T.		Montana.			
Sunnyside	16.7			Billings	5.0	5.0	0.0
Massachusetts.				Columbia Falls	5.0	0.0	T.
Amherst	5.0			Nevada.			
Andover	5.0	T.	2.0	Edgewood	6.0		
Bedford	7.0		0.5	Marlette Lake	7.0		3.0
Beverly Farms	12.0	T.	2.0	New Hampshire.			
Blue Hill	14.0	1.0	1.0	Alstead	9.5	6.0	0.5
Boston	6.4	0.0	0.3	Berlin Mills	19.5	2.0	3.0
Brockton	10.0	T.	0.5	Bethlehem	9.3	4.0	1.0
Chestnut Hill	9.5	0.0	1.0	Brookline	10.5	5.0	0.5
Concord	11.5	T.	0.5	Concord	9.0	4.0	T.
Dudley	10.5	0.0	1.0	Dublin	14.2	3.0	1.0
East Templeton	9.8	3.2	0.5	Grafton	5.1	4.0	T.
Fall River	7.0	0.0	1.5	Hanover	5.9	1.0	1.0
Fitchburg	10.0	0.0	0.5	Keene	11.5	3.0	0.5
Fitchburg	9.0	2.0	8.0	Lancaster	7.5	4.0	3.0
Framingham	7.5			Littleton	10.2	1.5	0.0
Groton	16.0	4.0	1.0	Nashua	9.5	T.	1.0
Hingham	7.5			Newton	5.0		
Lawrence	7.8			North Conway	12.0	0.0	2.0
Leeds	5.5	1.0	T.	Peterboro	11.8	6.0	1.0
Leominster	9.0	T.	0.5	Plymouth	13.1	3.0	1.0
Mansfield	13.0	2.0	0.5	Sanbornton	5.8	4.0	T.
Middleboro	6.5	0.0	0.5	Stratford	10.0	5.0	5.0
Milton	7.0			West Milan	20.2	9.0	
Monroe	15.0	6.0	4.0	New Jersey.			
Monson	13.0	0.0	0.0	Newton	7.0	T.	T.
Mount Nonotuck	10.2	0.0	0.5	New York.			
Natick	9.0	0.0	1.0	Albany	8.6	0.0	0.6
North Billerica	10.0			Alfred Center	11.7	0.0	0.0
Randolph	11.0	0.0	T.	Angelica	7.5	0.0	1.0
Roxbury	7.0	T.	0.5	Arcade	10.9	T.	0.8
Salem	11.4			Baldwinsville	23.0	3.0	2.0
Salisbury	9.0	T.		Bedford	8.3	T.	0.3
Somerset	12.0	T.	1.0	Brookfield	10.0	2.0	4.0
Springfield Armory	6.5			Buffalo	7.6	0.0	T.
Taunton	9.0		1.0	Cooperstown	9.0	2.0	2.0
Taunton	10.5	0.0	0.5	Eden	8.0		
Wakefield	10.5	T.	0.5	Fleming	8.0		
Webster	8.8			Friendship	13.2	0.0	2.0
Westboro	9.0	0.0	0.5	Glens Falls	8.2	1.0	0.2
Winchendon	11.0	3.0	0.5	Gloversville	14.0	T.	2.0
Winthrop	6.5	T.	0.5	Hamilton	13.0	0.0	5.0
Worcester	11.5			Honeymead Brook	5.8	0.0	0.6
Michigan.				Humphrey	18.4	0.0	3.0
Adrian	8.0	T.	0.0	Ithaca	5.4	0.0	0.5
Albion	6.8	0.0	0.0	Lebanon Springs	15.0	T.	4.0
Allegan	6.5	1.0	0.0	Le Roy	15.8	2.0	2.0
Alma	8.0	2.0	0.0	Lowville	6.0		
Alpena	10.4	0.0	T.	Malone	17.1	2.0	3.0
Ann Arbor	5.8	3.0	0.0	Marlboro	5.5	0.0	0.2
Ball Mountain	7.6			New Lisbon	9.5		
Berlin	9.3	0.0	0.0	North Hammond	6.6	T.	0.5
Berrien Springs	24.0	3.0		Number Four	9.9	2.0	3.5
Boone	13.1		1.5	Oswego	9.0	0.0	0.4
Bronson	6.0	2.5	0.0	Oxford	10.0		
Calumet	29.5	6.0	11.5	Palermo	14.0	T.	T.
Charlevoix	5.5			Perry City	11.0	0.0	0.7
Cheboygan	10.0			Plattsburg Barracks	6.5		
Detroit	6.9	T.	T.	Port Jervis	5.0	0.0	0.0
Fitchburg	11.0	4.0		Rochester	11.1	0.0	0.0
Gladwin	12.0			Romulus	6.0		0.8
Grand Haven	8.9	0.0	0.0	Saranac Lake	12.0	2.0	2.5
Grand Rapids	7.5	T.	0.0	South Canistota	11.3		2.0
Grape	7.0			South Kortright	6.0		
Grayling	12.0	0.0		Turin	18.1	T.	3.0
Hanover	7.5	2.0	0.0	Varysburg	10.1	0.0	0.0
Harbor Springs	13.0	0.0	0.0	Wappingers Falls	7.0	T.	1.0
Harrison	7.0		0.5	Waverly	7.9		
Harrisville	18.9			West Chazy	10.0		
Hart	17.0	8.0	T.	West Point	7.0		
Howell	6.5	1.0	0.0	North Dakota.			
Ivan	21.1	2.0	6.0	Keiso	13.0		
Jeddo	5.2	1.5	0.0	Minto	5.9		
Kalamazoo	6.5	2.0	0.0	Ohio.			
Lake City	11.5			Akron	5.3		
Lansing	7.0	0.0	0.0	Atwater	12.0	6.0	0.0
Lewiston	7.6	0.0	2.0	Auburn	10.4		
Madison	11.7	0.0	0.0	Bangorville	7.0	T.	
Marquette	26.1	2.7	8.4	Bellefontaine	5.0		
Mottville	13.2	5.0	0.0	Benton Ridge	11.0		

Monthly snowfall and amounts on ground, etc.—Continued.

State and station.	Total.	15th.	30th.	State and station.	Total.	15th.	30th.
Ohio—Cont'd.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	South Dakota.	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Big Prairie	7.0	0.5		Cross	5.7	2.2	
Binola	12.2			Oelrichs	5.5		
Bissells	18.0			Spearsfish	8.0	0.0	0.0
Bladensburg	7.0			Vermont.			
Bloomington	5.5			Brattleboro	12.6		
Bowling Green	9.6	1.0		Burlington	7.0	2.0	2.0
Canal Dover	5.0			Cornwall	9.0	4.0	1.0
Canton	7.1			Enosburg Falls	12.0		
Carrollton	7.0			Hartland	9.2	3.0	0.5
Celina	6.9			Irassburg	26.0		
Cleveland (V.O.)	7.5	0.0	0.2	Jacksonville	14.6	4.0	6.0
Colebrook	12.2			Northfield	16.1	4.6	2.0
Cynthiana	6.0			Norwich	10.5	5.0	2.0
Ellsworth	12.5			St. Johnsbury	7.0	2.0	2.0
Elyria	7.7			Simonsville	12.0	10.0	0.0
Garrettsville	15.1	T.		Stratford	20.0	8.0	4.0
Gratiot	6.3	T.		Wells	10.0	2.0	1.0
Greenhill	7.8	T.		Woodstock	12.0		0.5
Hedges	5.0			Washington.			
Hillhouse	5.2			Cascade Tunnel	58.0	2.0	29.0
Hiram	8.5	T.		Ellensburg	9.5		
Kenton	5.0			Pullman	5.0		
Levering	8.8			Stampede	16.8	0.8	4.0
Lordstown	10.5	1.0		West Virginia.			
Mansfield	12.2			Beverly	6.0		
Millport	11.3			Davis	9.0		
Montpelier	8.5			Marlinton	5.0		
Napoleon	5.0			Powellton	5.0		
New Alexandria	9.5			Wisconsin.			
New Berlin	5.8			Amherst	14.0	5.0	
New Bremen	5.0			Antigo	11.0	3.0	2.0
North Fairfield	8.8			Ashland	12.4		
North Royalton	6.5			Baraboo	7.5		
Northwood	6.0			Barron	14.0	0.0	
Norwalk	11.0			Bayfield	12.0		
Oberlin	7.5			Beaver Dam	19.0		
Orangeville	7.5			Belleville	6.5	0.0	T.
Ottawa	8.0			Beloit	9.2	0.2	0.0
Ridge	8.1			Black River Falls	14.0		
Rocky Ridge	14.0			Centuria	6.0		
Sharon Center	9.0			Chippewa Falls	5.0		
Shenandoah	11.2			City Point	8.0		
Sidney	5.5			Columbus	13.0	2.0	4.0
Toledo	6.0	0.0	0.0	Crandon	26.0	6.0	12.0
Upper Sandusky	8.4			De Pere	9.5	0.0	0.0
Vermilion	5.5			Florence	19.8		
Wauseon	8.2	T.		Green Bay	8.2	0.0	0.0
Wellington	8.0			Hartford	13.5	3.0	5.0
Weymouth	6.5			Harvey	12.8	3.2	2.5
Wheeler	11.0	2.0		Hayward	9.0	4.0	3.0
Wooster	11.3			Janesville	13.0		
Youngstown	10.5			Koenigick	19.0	12.0	8.0
Pennsylvania.				Lancaster	7.5	0.0	1.0
Cassandra	20.0	0.0		Lincoln	6.5		
Clarion	15.2			Madison	7.2		
Dubois	13.0			Manitowoc	5.8	T.	T.
Dyberry	7.0	2.0	2.0	Meadow Valley	6.5		
East Mauch Chunk	5.8	0.0	2.0	Medford	13.4	3.5	0.2
Edinboro	26.0	4.0	2.0	Menomonee	13.3	T.	1.5
Emporium	7.5		1.3	Milwaukee	9.1	T.	0.3
Erie	5.3	0.0	T.	Neillsville	8.0	4.0	2.0
Grampian	14.0	2.0	2.0	Oconomowoc	10.0	6.0	2.0
Honesdale	9.0			Oconto	7.0		
Oil City	7.3			Pepin	6.0		
Parker	5.0			Pine River	9.2	0.5	T.
Ridgway	9.5			Portage	6.5		
Saegerstown	11.2		T.	Royalton	8.7		
Salem Corners	7.9	0.2	2.0	Sharon	16.0	3.0	
Shinglehouse	16.5	T.	T.	Shawano	15.0	6.0	2.0
Smethport	11.0			Stevens Point	18.5		
Somerset	7.0			Valley Junction	5.5	0.0	0.0
Stoyestown	8.5			Viroqua	5.5		
Warren	15.0			Watertown	12.5		2.0
Wellsboro	8.0	T.	1.5	Waukesha	11.0		
Rhode Island.				Westfield	7.5	0.0	0.0
Kingston	6.5	0.0	1.5	Weston	9.5		
Lonsdale	9.0		0.0	Wyoming.			
Pawtucket	10.0	0.0	1.0	Sundance	6.0		
Providence	8.0						
Providence	7.0	T.	1.0				

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 23. Arkansas, 1, 23. Georgia, 23. Indian Territory, 1. Iowa, 4. Kansas, 1. Louisiana and Mississippi, 23. Missouri, 13. Nebraska, 28, 30. New Hampshire, 3. New Jersey, 10, 18. New York, 10. Ohio, 5. South Carolina, 23. Texas, 1, 2. Washington, 19, 23, 24, 25.

SLEET.

The following are the dates on which sleet fell in the respective States:

Connecticut, 5, 8, 9, 10, 14, 30. District of Columbia, 30. Idaho, 2

Kentucky, 5, 11, 17, 28. Maine, 25. Maryland, 10, 30. Massachusetts, 5, 6, 8, 9, 10, 24, 25. Michigan, 5, 6, 7, 29, 30. Minnesota, 3, 4, 6, 7, 8, 11, 12, 20. Missouri, 1, 13, 16, 18, 28, 29, 30. Nebraska, 1, 10, 11, 15, 30. Nevada, 27, 28. New Jersey, 5, 8, 9, 10, 24, 30. New York, 5, 8, 9, 10. North Carolina, 13. North

Dakota, 3, 11, 19, 25. Ohio, 1, 5, 6, 7, 9 to 13, 16, 19, 25, 28, 29, 30. Oklahoma, 16. Oregon, 15, 21. Pennsylvania, 5, 7 to 10, 21, 30. Rhode Island, 6, 8. South Dakota, 7, 9, 10, 11, 14, 19. Tennessee, 16. Vermont, 5. Washington, 23, 25, 26, 28. West Virginia, 5. Wisconsin, 3, 4, 9, 12, 29.

WIND.

PREVAILING DIRECTIONS.

The prevailing winds for November, 1894, viz, those that were recorded most frequently at Weather Bureau stations, are shown in Tables I and VIII; they are not given on Chart II, as has hitherto been the custom, but the resultant winds are published instead.

RESULTANT WINDS.

The resultant winds for the current month, as deduced from the hourly readings of self-registers at about 67 regular Weather Bureau stations, are given in Table VIII. Other resultants, deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, in connection with the isobars based on the same system of simultaneous observation; the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a wind of average velocity; these figures (or the ratio between them and the total number of observations in this month) indicate the extent to which winds from different directions counterbalanced each other. The original north, south, east, and west components are given in detail in Table IX.

During November the resultant movement was generally from the northwest in New England, west in the middle and south Atlantic States, southwest in the Ohio Valley and Tennessee and southern Rocky Mountain slope, northeast and southeast in the Gulf States, and southeast in the north Pacific coast region.

HIGH WINDS.

Maximum wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles.				Miles.	
Amarillo, Tex.	12	56	n.	Helena, Mont.	21	50	sw.
Do.	15	58	nw.	Huron, S. Dak.	28	50	se.
Do.	16	52	n.	Lander, Wyo.	19	55	sw.
Bismarck, N. Dak.	20	54	nw.	Do.	20	50	sw.
Block Island, R. I.	5	78	e.	Nantucket, Mass.	6	60	ne.
Do.	6	68	e.	Pueblo, Colo.	15	52	n.
Buffalo, N. Y.	3	50	sw.	Tatoosh Island, Wash.	8	50	e.
Fort Canby, Wash.	24	73	se.	Do.	24	58	e.
Do.	25	50	se.	Do.	26	57	e.
Cheyenne, Wyo.	19	56	w.	Williston, N. Dak.	8	50	nw.
Chicago, Ill.	20	60	sw.	Woods Holl, Mass.	3	50	n.
Cleveland, Ohio	24	52	w.	Do.	6	60	n.
Denver, Colo.	15	60	ne.	Do.	20	50	nw.
Eastport, Me.	3	56	se.	Do.	28	52	nw.
Helena, Mont.	19	52	w.				

LOCAL STORMS.

Destructive or severe local storms were reported as follows:

1st.—Near Shreveport, La., thunderstorm.

3d.—Eastport, Me., windstorm. Buffalo, N. Y., windstorm; one life lost.

6th.—Boston, Mansfield, and Monson, Mass., New Haven, New London, Greenfield Hill, and Hartford, Conn., and Bristol, R. I., snowstorms.

15th.—Denver, Colo., windstorm; one person injured.

17th.—Southwesterly winds prevailed in the south Atlantic States and southeast in Florida with numerous local rains, while colder northwest winds prevailed over Alabama and the west Gulf States. Under these conditions Jacksonville reports that three waterspouts were reported over the St. Johns River, southwest of station, just before 1 p. m.; they extended from the water to the clouds and appeared as spiral clouds traveling on the surface of the water.

19th.—Lander, Wyo., windstorm.

23d.—Hollands Store and Morton, Miss., thunderstorms. Topton, Miss., windstorm.

24th.—Oswego, N. Y., windstorm.

25th.—Burkittsville, Md., windstorm.

WIND SIGNALS FOR NOVEMBER.

As mentioned in a previous section the storm wind signals and the cold wind signals can scarcely be separated from each other in the winter months, they are, therefore, transferred from the section on storms to the section on high winds, and are in detail as follows:

In connection with low No. II the following signals were ordered: 1st, 1.45 p. m., southwest signals, Galveston and Corpus Christi; information, New Orleans, and Port Eads. Noon, storm southwest, Buffalo; 10.40 p. m., southeast, Port Eads, New Orleans, Mobile, and Pensacola.

2d, 9.50 a. m., storm southeast, Lakes Michigan and Huron, Sault Ste. Marie and Marquette; information, Duluth, Ashland section, Houghton section, and Pepin; 10.45 a. m., storm southeast, Lake Erie, information, Lake Ontario; 1.45 p. m., southwest storm, Rochester, Oswego, and section; 4.00 p. m., signals changed to storm northwest, Lake Michigan and Marquette; 11.00 p. m., change to storm southwest, Lake Erie.

3d, 9.45 a. m., southwest, from Breakwater to Boston section, except Atlantic City; 11.00 a. m., change to northwest, from Detroit to Oswego; 11.00 a. m., southwest, Portland and Eastport.

In connection with low area No. VI the following signals were ordered: 5th, 10.20 a. m., storm northeast, Newport section, Narragansett section, Woods Holl, and Boston section; storm northwest, Delaware Breakwater to New London; information, Portland and Eastport, Baltimore, and Norfolk, and section; 10.00 a. m., information at Duluth and Ashland section and on Lake Michigan, except at Frankfort section; storm northwest, Lake Huron, Sault Ste. Marie and section, Marquette and section, Frankfort section; 11.00 a. m., information, Lakes Erie and Ontario; 12.20 p. m., hoist northwest, Detroit to Oswego and section; 12.00 m., northwest signals at Punta Gorda, Key West, and Jupiter; 12.50 p. m., northwest signals from Wilmington to Baltimore; 1.10 p. m., northeast signals, Portland and Eastport; 9.15 p. m., change northeast to northwest, Newport section to Boston section; 6th, 1.10 p. m., northeast signals changed to northwest, Portland to Eastport.

In connection with low area No. VII the following signals were ordered: 7th, 1.40 p. m., information signals, Detroit to Oswego; 10.00 a. m., southwest, Buffalo. 8th, 11.20 a. m., information from Breakwater to Woods Holl section; 10.35 p. m., northeast, Narragansett section, and Woods Holl section.

In connection with low area No. VIII the following signals

were ordered: 9th, 11.00 a. m., southeast, Lakes Erie and Ontario; 10.00 a. m., southeast, Huron, Sault Ste. Marie section, all others on Lakes Pepin, Superior, Michigan, and Huron northwest; 5.00 p. m., Sault Ste. Marie section and Huron changed to northwest; 10.45 p. m., continue northeast, Naragansett and Woods Holl section; 11.00 p. m., southeast, Breakwater to Newport section, Boston and section; 8.00 a. m., change to northwest, Sandusky, Cleveland, Buffalo, Oswego, and section; 11.00 p. m., northwest, Norfolk and section, Newport News, West Point, Baltimore. 10th, 10.10 a. m., storm northwest, Lake Michigan, Marquette section, Houghton section, continue; 10.00 a. m., continue, Duluth section, and Ashland section, change to information.

In connection with low area No. IX the following signals were ordered: 12th, 10.00 a. m., storm northwest, all stations on Lakes Superior, Michigan, Huron, and Pepin; 11.10 a. m., information from Erie to Oswego, from Detroit to Cleveland, southwest; 1.10 p. m., southwest signals from Erie to Oswego section; 5.15 p. m., changed to storm northwest, Lakes Pepin and Superior, except Sault Ste. Marie section, Mackinaw. 13th, 10.00 a. m., information, all stations on Lakes Superior, Michigan, Huron, and Pepin; 11.10 a. m., southwest continued. 14th, 9.00 a. m., changed to northwest, Buffalo.

In connection with low area No. X the following signals were ordered: 14th, 5.57 p. m., storm southeast, Marquette section, Sault Ste. Marie section, Green Bay, Escanaba, Manistee; information at all other stations on Lakes Superior, Huron, and Pepin; 7.00 p. m., signals changed to storm northwest, Pepin, Ashland section, Houghton section, Milwaukee section, Chicago, Grand Haven section, Frankfort section; 11.00 p. m., storm southwest, Lake Erie and Detroit; 10.00 p. m., storm southeast, Alpena and Port Huron; 11.00 p. m., Lakes Huron and Erie. 15th, 10.00 a. m., storm southwest, on Lake Ontario; 10.05 a. m., all stations on Lakes Superior, Michigan, Huron, and Pepin changed to storm southwest, except Duluth; 1.00 p. m., southwest signals, Breakwater to Boston section; information, Portland and Eastport, Norfolk section to Baltimore; 6.00 p. m., storm southwest at all stations on Lakes Superior, Michigan, Huron, and Pepin; 10.50 p. m., information from Corpus Christi to New Orleans.

In connection with low area No. Xa the following signals were ordered: 16th, 1.20 p. m., northwest signals, Galveston; information, Mobile and Pensacola; 10.15 p. m., northwest, Corpus Christi, Port Eads, New Orleans.

In connection with low area No. XI the following signals were ordered: 18th, 11.12 a. m., information, all stations on Lakes Superior, Michigan, Huron, and Pepin; 10.35 p. m., storm northwest, Erie; 10.00 p. m., signals changed to northwest, Alpena, Port Huron, Marquette, Green Bay,

Sault Ste. Marie. 19th, 10.50 a. m., northwest, Oswego and section.

In connection with low area No. XII the following signals were ordered: 19th, 5.50 p. m., storm southeast, Lakes Pepin, Superior, and Michigan; 10.50 a. m., southeast, Detroit to Buffalo. 20th, 11.10 a. m., southeast, Lake Ontario; 5.10 p. m., signals changed to storm northwest, Lakes Pepin, Superior, and Michigan, and on Huron at daylight 21st; 10.15 p. m., change to storm southwest, Toledo, Sandusky, Cleveland, Buffalo.

In connection with low areas No. XIII and XIIIa the following signals were ordered: 21st, 6.14 p. m., information, Lakes Pepin, Superior, and Michigan. 22d, 10.00 a. m., information, Lake Huron. 23d, 10.30 a. m., storm southwest, Cleveland, Erie, Buffalo, and Ontario; 1.40 p. m., information, Breakwater to New London and Boston to Eastport; southwest signals Newport section to Woods Holl section. 24th, 11.00 a. m., information, Ontario and Erie to Toledo; 9.00 a. m., storm southwest, Buffalo; 9.55 a. m., storm southwest, Detroit; 10.00 a. m., storm northwest, Huron, Sault Ste. Marie, Grand Haven, and Frankfort section; information, west shore of Lake Michigan and Marquette section; 9.45 p. m., storm northwest, Cleveland, Erie, Lake Ontario; 10.40 p. m., information, Breakwater to New London, Boston to Eastport; 10.45 p. m., storm southwest, Newport section, Naragansett section, Woods Holl section. 25th, 9.10 a. m., northwest signals, Breakwater to New London and Boston to Eastport; southwest changed to northwest, Newport section to Woods Holl section.

In connection with low area No. XIV the following signals were ordered: 26th, 10.19 a. m., information at Detroit, Toledo, Sandusky, Cleveland, Erie, Buffalo, Rochester, Oswego section, and Oswego; 9.44 a. m., information, Duluth section, storm northwest, Pepin, Ashland section, Houghton section, storm southeast, all other points; 12.00 m., southwest signals, Toledo to Oswego; 5.10 p. m., storm northwest, Duluth section, Marquette section, Sault Ste. Marie section, and Lakes Huron and Michigan; 10.40 p. m., change to northwest, Lakes Erie and Ontario; 10.30 p. m., southwest signals, Breakwater to Eastport. 27th, 5.00 p. m., northwest signals continue, Sault Ste. Marie and Huron; 10.40 p. m., continue northwest on Lakes Erie and Ontario. 28th, 12.00 m., northwest signals, Breakwater to Eastport.

In connection with low area No. XV the following signals were ordered: 28th, 6.12 p. m., storm southeast, Lakes Pepin, Michigan, and Superior, except northeast at Duluth; 5.30 p. m., information, Lake Huron. 29th, 4.00 p. m., northeast signal at Jupiter; 5.30 p. m., southeast storm, Houghton section, Marquette section, Sault Ste. Marie section, Manistee section, Frankfort, Escanaba, Green Bay section, Mackinaw section; elsewhere on Michigan and Huron, information.

ATMOSPHERIC ELECTRICITY.

GENERAL STATISTICS.

The table showing in detail for November, 1894, the statistics relative to auroras and thunderstorms is placed among the meteorological tables as No. XI, instead of being given in the text as heretofore. It shows the number of stations from which meteorologic reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month.

THUNDERSTORMS.

A mention of the more severe thunderstorms reported during the month is made under "Local storms." The dates on which reports of thunderstorms were most numerous were: 1st, 39; 2d, 20; 16th, 13; 23d, 49; 30th, 23.

The States where thunderstorm reports were most numerous were: Alabama, Arkansas, Florida, Missouri, South Carolina, Tennessee, and Texas.

The States where the dates of thunderstorms were most frequent were: Texas, where they were recorded on nine days; Louisiana, on eight days; Iowa, on six days; South Carolina, on five days.

DAMAGE BY LIGHTNING.

No reports of damage done by lightning during November have been received.

AURORAS.

The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four days preceding and following the date of full moon,

viz, from the 8th to the 16th, inclusive. On the remaining twenty-one days of this month 74 reports were received, or an average of 4 per day. The dates on which the reported number especially exceeded this average were: 13th, 16th, and 24th, 8; 17th and 18th, 7. The States from which auroras were reported by a large percentage of observers were: North Dakota, 18; South Dakota, 8; Wisconsin, 9. The States where the dates of auroras were most numerous were: Iowa, 6; Minnesota, 15.

CANADIAN DATA—THUNDERSTORMS AND AURORAS.

No thunderstorms reported.

Auroras were reported as follows: 1st, St. Andrews, N. B.; 2d, Father Point, Que., and Medicine Hat, Assin.; 16th, St. Andrews, N. B., Minnedosa, Man., and Prince Albert, Sask.; 17th, St. Andrews, N. B., Quebec, Que.; 18th, Sydney, N. S., Grand Manan, N. B., and Minnedosa, Man.; 19th, Quebec, Que.; 22d and 23d, Medicine Hat, Assin.; 25th, Qu'Appelle, Assin., and 26th, Father Point, Que.

METEOROLOGY AND MAGNETISM.

The movements of our atmosphere are to be studied primarily as problems in the mechanics and thermodynamics of moving gases and vapors, but our knowledge of the empirical relations between atmospheric phenomena and those of terrestrial magnetism has been elucidated by a few special students, and further study in this direction has been recognized by the Chief of the Weather Bureau as proper and desirable. As the subject of atmospheric electricity, including that of auroras and earth currents, has a small section in this REVIEW, Professor Bigelow has consented to contribute a section on terrestrial magnetism.

THE COMPARISON OF TEMPERATURE WITH MAGNETIC HORIZONTAL FORCE.

By Prof. F. H. BIGELOW.

In response to the request of the Chief of the Weather Bureau, the directors of the observatories at Toronto, Washington, and San Antonio have courteously undertaken to forward to the Bureau, as promptly as possible, certain data from their magnetograms, namely, the mean ordinates for the day from twenty-four hourly readings of the horizontal force, the declination, and the vertical force, uncorrected for instrumental errors and changes of temperature. On days exhibiting very disturbed magnetic conditions the hours and the values of the maximum and minimum ordinates are given.

The object in collecting these data is to institute a comparison between the crude magnetic readings, particularly of the bifilar, and the temperature changes at meteorological stations in the Northwest. Ultimately such comparisons will show how far unreduced magnetic observations may be available for determining the direction and the intensity of the temperature variations and other weather conditions before these become fully developed, as given by the isotherms and isobars of the daily weather maps. It has already been shown that weather and magnetism conform on the average to a normal type, but the problem of the synchronous changes from day to day is still under advisement as a practical feature in forecasting. The original data are presented on Chart V in a slightly reduced form, without further comment, thus offering the reader an opportunity for individual study.

The columns headed Calgary, Williston, and Sioux City give for each day, respectively, the mean of the 8 a. m. and 8 p. m. observations of temperature at the following groups of stations:

Calgary for Minnedosa, Qu'Appelle, Prince Albert, Swift Current, Medicine Hat, Battleford, Edmonton, Calgary.

Williston for Valentine, Yankton, Huron, Pierre, Moorhead, Bismarck, Williston.

Sioux City for Springfield, Mo., Kansas City, Wichita, Concordia, Omaha, Sioux City.

The average temperature for each group is reduced back to the origin, W. 115°, N. 55°, by a correction for eastward drift (see Amer. Jour. Sci., Dec., 1894). The first differences of these numbers are taken; then the monthly mean of the first differences for slope; then the variations on the slope; then these latter are added successively throughout the month and the accumulated sums give the ordinates of the curve for each group; the mean of these three groups is taken and gives the curve in the upper part of Chart V; the monthly mean of the ordinates is added with reverse sign to reduce to a true datum line. Thus, the eastward drift and the slope have been eliminated, and the variations reduced to a zero base line.

The magnetic data are treated in the same way as the temperatures. The curve as plotted is the mean of the ordinates of the three stations. It has been found that at least five magnetic observations are required to eliminate local conditions and to give a true value of the external impressed field, though seven are better. By inspecting the columns it will be seen that local variations disturb the curves in certain cases. Hence, as the data now exists, the comparison can give only partially accurate curves as to detail, though the main features may be expected to appear.

SPECIAL FEATURES OF THE NOVEMBER CURVES.

The slope for the temperature curves is zero; the reduction to the zero base line is +9; the factor for amplitude is 1. The San Antonio magnetic curve is reduced for amplitude by the factor $\frac{1}{2}$; for its slope +1 is added. The final means for the three stations are reduced by the factor $\frac{1}{2}$ for the dates November 13-19, inclusive, during which magnetic disturbances prevailed; the reduction of the magnetic curve to a zero base line is +1. The function between temperature and magnetic force is not a constant ratio, as is known by comparing winter and summer amplitudes; also, during disturbances, the swing of the magnetic variation is wider than that of the temperatures of the same period. As the object now is to bring out the facts of synchronism and not the amplitude function, we must resort to arbitrary factors till the nature of that function is known.

The 26.68 day period began November 23, 1858.

Disturbances were reported on the following dates: Toronto, November 12, 13; Washington, November 13, 14; San Antonio, November 13, 14, 15, 17, 19.

SUNSHINE AND CLOUDINESS.

GENERAL REMARKS.

The quantity of sunshine, and therefore of heat, received by the atmosphere is a fundamental factor in meteorology; the quantity received by the atmosphere as a whole is very nearly

constant from year to year, but the proportion received by the surface of the earth depends largely upon the absorption by the atmosphere and varies with the distribution of cloudiness. The sunshine is now recorded automatically at about

38 regular stations of the Weather Bureau, either by its photographic or its thermal effects. The cloudiness is recorded by personal observations at all stations and is given in the column of "average cloudiness" in Table I.

SUNSHINE.

An instrumental record of sunshine has been kept during the month at 17 stations by means of the photographic sunshine recorder and at 21 stations by means of the thermometric sunshine recorder; the results of these observations are given in Table IV, for each hour of local mean time (not seventy-fifth meridian time). The stations recording the largest percentages of sunshine between the hours of 11 a. m. and 1 p. m. were: Tucson, 95.5; Salt Lake City, 94; San Francisco, 90; Denver, 88.5; Santa Fe, 88; Key West, 87. The stations having the least percentage between those hours were: Rochester, 21.5; Spokane, 24.5; Portland, Oreg., 31; Buffalo, 38; Cleveland, 39.5; Bismarck, 40.5.

The general average percentage for the whole month is given in the next to the last column of Table IV. The highest percentages were Tucson, 96; Santa Fe, 91; Denver, 81; Salt Lake City, 80; Dodge City, 79; San Francisco, 77; Galveston and Memphis, 75. The lowest percentages were: Rochester, 15; Buffalo, 24; Spokane, 26; Portland, Oreg., 28; Cleveland, 33; Bismarck and Chicago, 37.

CLEAR SKY.

The average cloudiness between sunrise and sunset, as based on numerous personal observations, is given for each Weather Bureau station in Table I; the complement of this average cloudiness gives the observer's estimated percentage of clear sky and these latter numbers are given in the last column of Table IV.

COMPARISON OF SUNSHINE AND CLEAR SKY.

The sunshine registers give the duration of direct sunshine whence the percentage of possible sunshine is derived; the

observer's personal estimates give the percentage of area of clear sky. It should not be assumed that these numbers should agree, and for comparative purposes they have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observer's personal estimates of percentages of area of clear sky; the average excess for this month is 8 per cent for photographic records and 7 per cent for thermometric records. Attention has lately been called to a similar excess in the record of the observers in India.

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.			Thermometric stations.	Instrumental.		
	Instrumental.	Personal.	Difference.		Instrumental.	Personal.	Difference.
Tucson, Ariz.	96	86	10	Salt Lake City, Utah	80	68	12
Santa Fe, N. Mex.	91	82	9	San Francisco, Cal.	77	72	5
Denver, Colo.	81	62	19	Key West, Fla.	74	56	18
Dodge City, Kans.	79	67	12	Vicksburg, Miss.	73	72	1
Galveston, Tex.	75	75	0	Little Rock, Ark.	73	66	6
Memphis, Tenn.	75	69	6	Baltimore, Md.	70	61	9
Kansas City, Mo.	70	56	14	St. Louis, Mo.	64	63	1
Savannah, Ga.	68	69	-1	Wilmington, N.C.	64	66	-2
San Diego, Cal.	67	59	8	New Orleans, La.	61	61	0
Washington, D. C.	65	66	-1	Philadelphia, Pa.	57	51	6
Cincinnati, Ohio	55	44	11	New York, N. Y.	56	50	6
Eastport, Me.	47	35	12	Louisville, Ky.	56	44	12
Helena, Mont.	45	45	0	Columbus, Ohio	53	47	6
Bismarck, N. Dak.	37	38	-1	New Haven, Conn.	53	53	0
Cleveland, Ohio	33	27	6	Boston, Mass.	49	46	3
Portland, Oreg.	28	36	-8	Portland, Me.	44	36	8
Spokane, Wash.	26	19	7	Des Moines, Iowa	43	41	2
				Detroit, Mich.	42	37	5
				Chicago, Ill.	37	35	2
				Buffalo, N. Y.	34	16	18
				Rochester, N. Y.	15	19	-4

* A thermometric sunshine recorder was substituted for the photographic recorder on November 14, but as no comparative records were furnished therefore this difference of 5 for the whole month depends on both forms of instruments, and is omitted from the general means.

† Hourly values for 22 days; total and percentages for 30 days.

‡ Record for 21 days.

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS.

The following table shows the danger point and the highest and lowest stages for the month of November, 1894:

Heights of rivers above low-water mark, November, 1894.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>	Feet.	Feet.		Feet.		Feet.
Shreveport, La.	29.2	4.2	10, 11	5.4	28-30	1.2
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	1.4	3-5	0.2	24-30	1.2
Little Rock, Ark.	23.0	3.8	6	2.3	26-29	1.5
<i>Missouri River.</i>						
Bismarck, N. Dak.	75.0					
Pierre, S. Dak.	13.0	2.1	1, 2	1.8	13-17	0.3
Sioux City, Iowa	18.7	6.4	1	5.6	12-14, 18	0.8
Omaha, Nebr.	18.0					
Kansas City, Mo.	21.0	7.1	2, 3	5.0	30	2.1
<i>Mississippi River.</i>						
St. Paul, Minn.	14.0	2.6	29	1.0	17-18	1.6
La Crosse, Wis.	10.0	2.7	13, 15	0.8	29	1.9
Dubuque, Iowa	16.0	2.8	17	1.0	23-24	1.8
Davenport, Iowa	15.0	1.9	19	0.4	30	1.5
Keokuk, Iowa	14.0	1.3	19, 22	0.2	30	1.1
Hannibal, Mo.	17.0	1.7	19, 20, 23	1.0	1, 2, 29, 30	0.7
St. Louis, Mo.	30.0	3.4	9, 10	2.5	1, 2	0.9
Cairo, Ill.	40.0	4.9	27	1.9	1-3, 5	2.0
Memphis, Tenn.	33.0	0.1	28-30	1.4	6-8	1.3
Vicksburg, Miss.	41.0	4.1	30	5.2	9-14	1.1
New Orleans, La.	13.0	3.4	3, 4	2.0	15, 16	1.4
<i>Ohio River.</i>						
Parkersburg, W. Va.	38.0	7.5	22	1.8	1	5.7
Cincinnati, Ohio	45.0	8.9	27	3.5	2	5.4
Louisville, Ky.	24.0	5.0	29	2.8	1, 8	2.2
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	1.6	28, 30	0.1	1-3	1.7
<i>Tennessee River.</i>						
Chatanooga, Tenn.	33.0	2.3	3	0.7	18	1.6
Knoxville, Tenn.	29.0					

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Monongahela River.</i>	Feet.	Feet.		Feet.		Feet.
Pittsburg, Pa.	22.0	6.7	7	5.0	1, 14	1.7
<i>Savannah River.</i>						
Augusta, Ga.	32.6	15.3	4	5.4	12	9.9
<i>Willamette River.</i>						
Portland, Oregon	15.0	5.6	27, 30	1.9	22	3.7
<i>Saguache River.</i>						
Harrisburg, Pa.	17.0					
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	0.4	27	0.5	15	0.9
<i>James River.</i>						
Lynchburg, Va.	18.0	2.4	3	0.1	23, 27-30	2.3
<i>Sacramento River.</i>						
Red Bluff, Cal.	22.0	3.5	28	0.8	3-5	1.7
Sacramento, Cal.	25.0	9.3	1, 2	8.2	24-27	1.1
<i>Des Moines River.</i>						
Des Moines, Iowa	19.0					

* Record for first 17 days only.

† Record for first 15 days only.

FLOODS AND NAVIGATION.

The above reports show that no floods occurred in the principal rivers and none were reported elsewhere. Owing to the low stage of water in the Ohio, Missouri, and upper Mississippi rivers navigation was generally impeded or stopped altogether, and in the lower Mississippi was often conducted with great difficulty.

ICE IN RIVERS.

The condition of navigation as affected by ice and the low water is shown in the following paragraphs:

Red River of the North.—University, N. Dak., 19th, river frozen over. Fergus Falls, Minn., 10th, river closed by ice.

Wisconsin River.—Stevens Point, Wis., 11th, river frozen.
Des Moines River.—Des Moines, Iowa, 18th, river frozen.
Lake Pepin.—Pepin, Wis., 19th, frozen.
Thunder Bay River.—Alpena, Mich., 19th, frozen.
Kennebec River.—Gardiner, Me., 28th, closed for navigation.
Red River.—Shreveport, La., 24th, navigation suspended on account of low water.
Missouri River.—Williston, N. Dak., 18th, frozen over. Pierre, S. Dak., 10th to 14th and 17th, running ice; 18th, west channel closed during the night and east channel partly closed. Forest City, S. Dak., 10th, ice in river. Santee

Agency, Nebr., 19th, floating ice. Plattsmouth, Nebr., 10-12th and 19th, floating ice. St. Joseph, Mo., 19th to 24th, ice running in river.

Mississippi River.—Winona, Minn., 30th, river closed. St. Paul, Minn., 29th, frozen; 30th, river gauge readings suspended for the season. Le Claire, Iowa, 21st-27th, floating ice; 28th, river closed by ice. Muscatine, Iowa, 19th, floating ice. Davenport, 19th-21st and 27th, floating ice. La Crosse, Wis., 11th, ice in the stream; 18th, ice along the shore; 19th, river full of floating ice. Keokuk, Iowa, 25th, navigation closed.

OBSERVATIONS ON THE GREAT LAKES.

REPORTS FROM U. S. LIFE-SAVING STATIONS.

Through the co-operation of the General Superintendent of the Life-Saving Service and the Secretary of the Treasury, the Weather Bureau has received monthly reports for the

month of November, from the keepers of 37 U. S. Life-Saving Stations on the Great Lakes.

REPORTS FROM VESSELS.

The Lake Marine Section, Forecast Division, has received reports from the captains of 39 vessels navigating the Great Lakes.

STATE WEATHER SERVICES.

A tabular summary of the more prominent climatological features of each State and Territory, as given in the reports for November by the directors of the respective State Weather Services, is presented in Table XII. This table gives for the whole area of any State: (a) the average departure from the normal values of the current monthly mean temperatures and total precipitations; (b) the maximum and minimum temperatures and precipitations; (c) the greatest and least monthly ranges of temperature occurring anywhere within the State. This table is essentially a summary of Table II, and therefore presents a somewhat different study of meteorological conditions from that given in Table I, which is based on regular Weather Bureau stations arranged in so-called climatic districts.

The following extracts are taken from the reviews published by the respective services; occasional notes in brackets are added by the Editor:

Alabama.—The month of November will pass into meteorological history as one in which the rainfall was the least for a number of years. This deficiency in rainfall has kept the rivers at an unusually low stage, preventing general navigation. Some of the highest temperatures of the month were recorded on the 2d and 3d and the coldest weather on the 12th, the temperatures falling to freezing or below.

Arkansas.—The weather was favorable for gathering crops, but too dry for fall-sown wheat and oats. Forest fires prevailed in several counties, destroying much timber and some fencing, but otherwise did but little damage.

Florida.—The spell of cold weather on the 12th and 13th was unusually severe for the time of year. The temperature fell to, and in some cases below, the freezing point generally throughout the western portions of the State. At Jacksonville on the morning of the 12th it reached the lowest point ever reached during the second decade of November since the beginning of observations by the Weather Bureau in 1871. The frosts are reported to have done but little damage except to tender vegetation.

Georgia.—A pleasant month with no storms of marked severity.

Idaho.—The month was generally fair and pleasant all over the State, with the exception of the 16th, when a decided cold wave was experienced in all sections.

Indiana.—The conditions of the weather during November were very pleasant and favorable for farm work, and corn gathering was completed, but young crops and pasturage suffered more or less for want of rain; wells, springs, and many smaller streams having become dry, farmers continued to haul water for the live stock.

Iowa.—The month was generally favorable for farm work, but too dry for the farmers' needs, especially in localities where there was a scarcity of stock water.

Nevada.—The three months ending with November closed a remarkable period of weather for this State. The temperature while naturally decreasing remained abnormally high. The sunshine was far in excess of the nor-

mal, there being an average of 20 clear days during this month. On several occasions earthquake shocks have been felt, but no serious damage has been done. First killing frost occurred at Golconda on the 16th. Stofiel: Not for several years have we had such a mild November; trees are putting forth abnormal buds and green grass is two inches high.

New England.—The month has been very disagreeable in the north with much cloudy and stormy weather, though the total precipitation was light. The streams and wells there are much lower than usual at this season. Eleven cyclones and nine anticyclones influenced the weather of New England for this month. One of these cyclones formed just south of New England and moved up our eastern coast; it was the most severe for the month in all southern sections; it formed off the New Jersey coast on the 5th and passed east of us with rapidly increasing energy, giving heavy rain and snow and high gales. The snow was very damp and froze to whatever it came in contact with. Telegraph and telephone wires were like great cables, and trees and shrubs were heaps of ice and snow. The weight of this load with the high gale that prevailed did great damage to fruit and shade trees and brought down telegraph poles by the hundreds.

New Jersey.—Millville: The first cold-wave warning of the season was received on the 19th at 1.55 p. m., and the cold wave arrived in time on the 20th with a fall of 31°; on the 24th dandelions were in bloom. Bridgeton: We have had a very remarkable autumn, no killing frost until the 12th; lima beans picked and brought to market as late as the 6th. Rancocas: The month very favorable for belated huskers; some sweet potatoes were being dug on the 15th. Oceanic: November goes out with no frost in the ground, grass fresh and growing, and dandelions in bloom in many places. Toms River: Farmers brought strawberries to market on the 12th. Franklinville: Rather a cold month, being 4.9 below the mean for the past seven years.

New York.—The month was characterized by large ranges of temperature and pressure, and was, on the whole, slightly colder than the average November. The fifth anticyclone of this month, which passed over the Southern States and aided the inflow of warm air toward the depression then over Canada, caused a warm wave, which was terminated by an intense anticyclone on the 19th, and which, in the four days following, reduced the temperature in the northern part of this State more than 40°. Warm waves accompanied the storms of the 24th and 27th, and with the rise of pressure following the latter, the coldest day of November also occurred. Strawberry and raspberry blossoms were seen at South Canisteo on the 1st, and the dandelions were in bloom on the 2d at Malone.

North Carolina.—Quite an uneventful month. The temperature was nearly 2° below the normal, and the precipitation nearly 2 inches. The weather was very pleasant during the greater part of the month. Killing frosts occurred nearly everywhere in the west on the 6th, and over the central part of the State on the 7th and 11th. Weather favorable to all out-door pursuits, but very unfavorable to recently sown grain, such as rye, wheat, etc. Owing to the dry weather, forest fires were very common; dense smoke on the 29th.

North Dakota.—The month was unusually fine in this State. It was warm and bright, with temperature above zero until the 18th, when a cold wave completely covered the State for two days.

Ohio.—The weather during the month was marked by deficient rainfall and temperature and excess of cloudiness. The rainfall was well distributed throughout the month and proved beneficial to the wheat. Sufficient snow fell before the coldest days of the month to serve as a protection to the cereals in the ground.

Oklahoma.—Wheat prospects were never more unfavorable November 30 than this year. Much that was planted in September and October has remained as planted, not having sprouted, on account of want of moisture, and that which came up all right is dried up and dead to the surface of the ground, and some of our farmers say that many of the roots are dead also. On account of the continued low price of wheat and unfavorable conditions for fall sowing the acreage is possibly 25 per cent. less than last year; so that it looks as if next year's crop might be short.

Up to the present time there has been no fall pasturage to amount to anything, so that hay, straw, and other forage crops are commanding good prices. Straw, which in other years was allowed to rot in the fields, is now being carefully preserved and fed to stock. Stock water is exceedingly scarce and hard to get on the ranges, and cattle and horses have in many instances to be driven many miles to secure a supply.

South Dakota.—As a whole the month was unusually pleasant and favorable for late autumn farm work. The general absence of snow on the ground

was very favorable for the continuous grazing of live stock on the ranges, thereby economizing the stock of cut hay, of which there was considerable shortage at the beginning of the winter or feeding season.

Tennessee.—Covington: The drought which began about the middle of September continued throughout the month, causing great scarcity of water throughout this section and serious damage to vegetation; forest fires have caused some loss of fencing, and in some places crops have suffered from the heat of the fires. Greenville: This has been the driest month of which we have any record; wheat is needing rain badly. Nunnally: The weather during most of the month has been favorable for farm work; a considerable area has been sown in wheat; stock water is very scarce in some localities; forest fires have been raging a considerable portion of the month.

Utah.—A remarkably uneventful month; very clear, no precipitation whatever, no heavy winds; harvesting entirely finished, thrashing finished last week; the mildness of the fall has been very beneficial for the well-being of the beef stock.

NOTES BY THE EDITOR.

OBSERVATIONS AT HONOLULU, HAWAIIAN ISLANDS.

As the weather on our Pacific coast depends so largely upon the conditions of the atmosphere to the westward, it is considered important to publish in full and as soon as practicable the data furnished by observers in Alaska, the Hawaiian Islands, and adjacent regions.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, -0.06 , is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

November, 1894.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Minimum.	Maximum.	Relative.		Absolute.	Direction.	Force.		
									9 a. m.	9 p. m.					
	In.	In.	In.	°	°	°	°	°	°	°	°			In.	
1....	30.11	30.03	30.10	73	78	74	72	80	59	70	6.0	ne.	4	5	0.02
2....	30.12	30.03	30.11	71	79	73	71	80	60	70	6.8	ne.	3	8.4	0.05
3....	30.12	30.02	30.10	69	79	73	68	81	67	73	6.6	nne.	2	8.2	0.08
4....	30.05	29.97	30.04	73	80	67	72	81	56	83	6.1	ne s.	2	5.0	0.00
5....	30.03	29.94	30.03	63	81	70	63	84	59	83	6.8	n-s.	1	1	0.00
6....	30.07	29.95	30.06	66	81	72	66	82	71	85	7.1	sw.	2	3	0.00
7....	30.04	29.93	30.02	67	80	73	67	82	75	80	7.1	sw.	2	2	0.00
8....	30.03	29.96	30.03	69	79	70	69	82	77	80	7.1	sw.	2	5.0	0.00
9....	30.09	29.99	30.07	68	81	71	66	81	74	85	7.2	sw.	2	2	0.00
10....	30.06	29.96	30.05	67	79	72	66	81	71	84	7.1	sw.	1	1.5	0.00
11....	30.03	29.91	29.98	70	77	70	70	80	80	83	7.1	w-s-s-w.	1	7	0.04
12....	29.95	29.87	29.93	67	79	75	67	80	77	77	6.9	sse.	4	3	0.00
13....	29.96	29.91	29.99	75	78	75	74	80	77	77	7.5	s.	4-2	8.4	0.00
14....	30.00	29.93	29.96	73	78	77	72	80	77	76	7.7	s.	3	10	0.00
15....	29.95	29.91	29.91	70	74	73	68	75	90	80	7.6	e-s-w.	1-4-1	1.77	0.00
16....	29.97	29.90	29.97	72	78	71	69	82	73	86	7.3	ne-s.	2	6-10	1.10
17....	30.02	29.96	30.08	68	80	75	68	82	75	77	7.2	ne.	3	3	0.00
18....	30.11	30.02	30.12	73	79	73	71	81	67	76	6.7	ne.	3	3	0.00
19....	30.10	30.01	30.10	67	77	70	65	79	80	80	6.3	nne.	3	5	0.00
20....	30.10	29.97	30.01	71	76	73	67	77	63	74	6.4	nne.	3	0.34	0.00
21....	30.00	29.95	30.01	71	76	74	66	77	72	74	6.8	ne.	4	8-3	1.02
22....	29.99	29.91	29.99	71	79	72	69	79	77	88	7.1	ne.	4	3-8	0.38
23....	30.04	29.94	30.02	71	78	73	69	82	75	85	7.5	a-ne.	3	10-8	0.18
24....	29.98	29.92	29.99	69	77	69	67	79	77	80	7.0	n-e.	2	3	1.70
25....	30.01	29.94	30.00	64	78	67	64	79	74	85	6.8	n-s.	1	3	0.00
26....	30.01	29.94	30.02	65	78	67	64	79	74	80	7.2	se.	2	5	0.00
27....	30.09	29.98	30.07	70	79	68	68	79	95	95	7.5	s.	1	5-2	0.47
28....	30.11	30.02	30.08	65	77	73	65	79	80	74	6.8	n.	1	6	0.67
29....	30.11	30.03	30.08	68	77	70	67	77	70	75	6.7	ne.	2-4	7	0.67
30....	30.12	30.05	30.12	67	72	70	67	75	68	67	5.8	nne.	4-6	6	2.40
	30.045	29.963	30.034	69.1	78.1	71.9	67.9	79.8	73.3	79.6	6.9				10.35

Mean temperature: $6+2+9+3$ is 73.0° ; the normal is 74.0 ; extreme temperatures, 84° and 63° .

Thunderstorms: 22d, lightning at night; 24th, 2 a. m., thunderstorm from the sw.; 25th, lightning; 27th, thunderstorm from sw. up to 9 a. m.

High winds: 8. to w.; storm 13th; heavy rain all over group, 15th, 21st, 29th, 21st, and 29th, northerly; squally; gale, nne., 30th. From 10 to 30 inches of rain at different points on Island of Hawaii for month; 8.31 inches of rain in 24 hours on the 21st at Hilo.

PROTECTION FROM FROST.

In response to numerous inquiries the following text is offered:

The proper limiting temperature at which the smudge fires

should be lighted, the number of such fires, the best, namely the cheapest materials to use, all depend upon local circumstances, and must be determined on the spot for each special case. The general rule is that if the local temperature has fallen to 40° or 45° F. in the early evening, if the sky is clear and the wind light, and there is no reason to expect that it will cloud over or become foggy, or very windy, then it will be frosty in the early morning, at least in those spots that are specially liable to frost. If there is even a moderate breeze during the night the smudge smoke will be blown away and do but little good; but in still nights and places sheltered from the wind the smudge should be lighted before 9 p. m. and kept up until danger is past. The smudge materials most approved consist of mixtures of tar, oil, and the refuse from refineries, with wood chips, damp straw, leaves, peat, dried corn stalks, and the fine waste of soft coal. But all these materials are expensive, or in some cases very valuable as manure and as mulching, so that the farmer dislikes to burn them up. In many cases sprinkling with water is as satisfactory as smudging, and although this involves considerable labor, yet it is oftentimes more desirable. The water warms the plants and the soil; it adds moisture to the air and sometimes even may help to make a little local fog; it has to be put on several times during the night either with a hose or the watering pot. Potatoes, beans, and even orange trees have often been saved in this way. If there is plenty of water, little streams may be allowed to run down the furrows of the field; they give off warmth and moisture just as in the case of sprinkling. Cranberry bogs are flooded to prevent frost.

Covering with some sort of shield protects the plants from radiation and saves them from freezing, even though the surface of the ground may get very cold. Such covers may be made of tubs or half barrels; of conical caps of pasteboard, matting, or newspaper; of light wooden frames over which cambric or mosquito bar is stretched; of coarse matting or of rough trellis work. Sometimes a bolt of cloth is rolled up on a reel at one end of a row of plants, and two persons holding the end of the cloth walk down the row unrolling the cloth and covering the plants completely; short stakes should be placed along the row so that the screen will rest upon them a few inches above the plants. For a single night old newspapers are as useful as cloth. A gentleman in Washington has made a very serviceable screen of ordinary laths tied together about two inches apart on a pair of ordinary clothesline ropes; flexible wire will do as well; this screens against hot sun by day and frost by night, and can easily be rolled up out of the way when not in use. Old venetian blinds, Japanese screens, or old floor matting are fair substitutes. Rows of vertical walls or screens tipped against each other, forming an A, do good service.

Rows of tall-growing plants set between the rows of delicate

vegetation act as shields against wind and radiation. Thus tall hop vines on poles, tall corn or cane stalks, or pole beans protect the lower vegetation from cooling by radiation. When the plants are very small a mulching of straw may be spread over them for the night.

If the frost comes suddenly and there are no smudges or shields prepared, but there is on hand a barrel of grease, oil, tar, turpentine, or crude petroleum, then set the barrel on a wheelbarrow and roll it up and down the furrows, leaving streaks of the inflammable material on the ground. Set fire to the streaks after the barrel is safely out of the way.

Anything that can be done to stir up a rather rapid circulation of air will mix the colder air near the ground with the warmer air above it and greatly retard the cooling and the frost.

Ten per cent of protection from radiation will often save a crop almost as well as complete protection. A thermometer placed in an open spot in the field that is to be protected can easily be arranged to ring a bell automatically when the temperature falls to 40° or 45°. This temperature limit must be adjusted to suit each field and plant. Such a frost annunciator can easily be made if it is not to be found on sale in the shops and stores. A special design is now under consideration by the Weather Bureau.

HAS THE WIND ANY EFFECT ON THE THERMOMETER? DOES IT LOWER THE TEMPERATURE OF THE AIR TO SET IT IN MOTION?

The above questions have been propounded by one of the correspondents of the Weather Bureau, and a reply is desired for the general information of Weather Bureau observers. As above worded these questions may seem to involve two or three principles in physics:

1. When perfectly quiet air under a given barometric pressure is suddenly released from even a small portion of that pressure it expands; that is to say, it begins to move, but with this expansion occurs a lowering of temperature, so that from this point of view the temperature of the air is changed when the force that sets it in motion is simply the internal elastic pressure of the air itself. The temperature falls about 1° when its pressure falls 0.2 inch of the mercurial barometer. This conversion of static pressure or potential energy into momentum, or the kinetic energy of the wind, is important in the study of the mechanics of the atmosphere, but not so in ordinary local meteorological observations.

2. When the wind blowing over a country of varied topography raises the cool air from the lower valleys and stirs up the hot air over the plains and sunny nooks it thereby brings masses of different temperature to blow successively over a thermometer, and in that sense of the word it may be said that the wind has an effect on the thermometer.

3. When a thermometer is hung in the open air in such a way that the sun may shine upon it, or the sun's heat reflected from neighboring rocks and woodwork may strike it, or so that the bulb may radiate to the cold sky, the temperature of the thermometer will be in the first case warmer, in the last case colder, than that of the air in its neighborhood, and if now a wind blows upon it the thermometer will respectively fall or rise so as to attain a temperature nearer to that of the wind. This explains why Weather Bureau observers are always cautioned to obtain as near as possible the true temperature of the air by placing their thermometers within a light shelter, such that the wind can blow through freely without allowing the thermometer to be affected by any loss or gain of radiant heat.

4. When a violent wind blows against any obstacle the air is compressed on the windward side and generally is slightly expanded on the leeward side; the compression warms the compressed air and the thermometer reads higher than it

would in air of the same temperature with a gentler wind; this warming may amount to 1° in extreme cases but is inappreciable for ordinary winds. The Weather Bureau instructions require the regular observers to whirl their thermometers at the rate of 10 feet per second on an apparatus provided within the thermometer shelter; in this way the effect of any small amount of injurious radiation is annulled, and the thermometer gives the temperature of the air that is at that time inside the shelter. Evidently it does not matter whether the thermometer moves through the air or the air blows past the thermometer.

THE WARM AIR ATTENDING LOW AREAS.

A general review of the development of areas of 20° rise or fall during November must impress one with the conviction that the temperatures experienced at the earth's surface depend quite as much upon dynamic warming and cooling as upon direct insolation, or the horizontal transfer of warm and cold air, or the protection afforded by cloudiness. When an area of low pressure appears in Alberta the cloud layer moves rapidly from the southwest over Washington, Oregon, and Idaho, giving that region rain or snow. This air may be said to be pushed, by the high pressure on the Pacific, northeastward over the crest of the Rocky Mountains; in its descent on the eastern side it produces the rapid rise of pressure chronicled in the above-mentioned areas of 20° rise. Similarly, any area or ridge of high pressure extending from the Rocky Mountain plateau westward feeds the low areas on the eastern slope with descending warm air, the maximum rise of temperature being usually quite near the area of lowest pressure, and on its southeast or southwest side. The fact that this air is descending the eastern Rocky Mountain slope and, therefore, being dynamically warmed is so apparent that one is apt to forget that it must also have an additional descending motion independent of, and often steeper than that of the slope of the land. This latter fact becomes more impressive as the low area moves eastward into the comparatively flat country of the Mississippi Valley and Lake region.

On the other hand, when a low pressure in the Mississippi or Ohio valleys has a high area on the southeast side, pushing in from the Atlantic, the region of 20° rise is on the east or southeast side of the low, showing that the air which is being pushed from the Atlantic High into the low area is again, as before, descending and warming. In general, therefore, the air that flows into a low area on its southwest, south, and southeast sides, has a descending component sufficiently rapid to produce an appreciable warming effect independent of the presence of mountain ranges; it is, therefore, not a föhn wind or chinook in the technical sense of the word, although, like these, it owes its warmth to descent and compression. The maps from November 10, 8 p. m., to the 13th, afford an excellent illustration of this dynamic formation of a small area of high temperature on the south side of a low pressure within masses of air that have passed east over the Rocky Mountains, and the maps of the 14th, a. m., to the 15th, a. m., show a repetition of this process. The map of the 15th, p. m., shows a warm area in the Ohio Valley, due to the flow of descending air from the high pressure on the coast of the Atlantic, and the map of the 17th, a. m., apparently repeats this process in the same region, while at the same time it shows the northern Rocky Mountain slope covered with a warm area, descending from the ridge of high pressure that covers the plateau.

ATMOSPHERIC WAVES.

The origin of the areas of high and low pressure and the mechanical explanation of their continuance for several days or weeks has been a subject of many hypotheses and investigations. Sir John Herschel and William Birt were inclined to look upon them as the ridges and troughs of waves in the

atmosphere similar to those of the ocean. Ferrel studied the connection between the winds and pressures as though he thought the low pressures were essentially due to cyclonic and the high pressures to anticyclonic systems of winds. In his "Preparatory Studies" the Editor has considered the movements of the atmosphere as analogous to the turbulent flow of a river in which ascending rushes and descending eddies alternate with each other, and where the pressures at the bottom of the stream must depend upon the irregularities of the local resistances almost as much as upon the centrifugal forces within the eddies. In such a river the motions within the eddies and rushes are not merely small disturbances in the general flow of the water, but are in reality the general flow itself distorted into innumerable complicated curves. On the surface of such a river at flood stage and superposed upon the eddies that pervade its depths one may see a system of surface waves reflected from shore to shore, or a system of standing waves below any special obstacle.

The atmosphere doubtless presents such phenomena as these, and also other but similar waves of pressure depending on heat, on the evaporation and condensation of aqueous vapor, on lunar and solar tides, and even on great eruptions such as that of Krakatoa. The lower atmosphere is moreover, subject to a system of waves produced by the horizontal motion of the upper atmosphere over it, just as the wind produces waves in the ocean. This latter class of waves has been investigated by von Helmholtz (reprinted in the work en-

titled "Mechanics of the Atmosphere") and has led to the suggestion by others, that when such systems of waves cross each other the atmosphere is thereby divided into a systematic tessellated series of areas of high and low pressures, and that in this way areas of high and low pressure may originate. But if these waves are in progressive motion the resulting areas will move, and will therefore endure but a very short time at any one spot, thereby differing so much from the observed duration of highs and lows that this wave formation can scarcely explain the movements of these areas. It is, however, conceivable that in rare and special cases the low area thus formed may contribute to the expansion and cooling and formation of fog, cloud, or rain in the lower strata, and that under favorable circumstances the change thus initiated may develop into a local disturbance and grow into an extensive storm.

The Editor finds but rarely occasion to refer to atmospheric waves in his notes explanatory of the phenomena dealt with in the WEATHER REVIEW, because a daily chart of the whole Northern Hemisphere is needed in order to study them. On the other hand the great masses of air in motion afford daily illustrations of the powerful action of the centrifugal force due to the diurnal rotation of the earth, by reason of which cold or dry and, therefore, denser air is driven rapidly toward the equator, thereby pushing warmer, moister, and lighter air back toward the pole. The high pressure areas seem to result from this dynamic action.

METEOROLOGICAL TABLES.

[Prepared by the Division of Records and Meteorological Data.]

The following pages present in tabular form the climatological data for the current month, on which the text of the preceding part of this REVIEW has, to a large extent, been based.

For a detailed description of the methods of observation, compilation, and computation relating to these tables, the reader is referred to page 129 of the MONTHLY WEATHER REVIEW for March, 1894. The general contents of the tables are as follows:

Table I gives for 140 Weather Bureau stations, making two observations daily, and for 10 others making only one observation, the ordinary climatological data.

Table Ia gives for 140 Weather Bureau stations, making two observations daily, the monthly extremes and means of the temperature of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

Table II gives for about 2,200 stations, occupied by voluntary observers, the mean and extreme temperatures and the total precipitation.

Table III gives climatological data for about 30 Canadian stations.

Table IVa gives for 38 Weather Bureau stations the percentages of sunshine for each hour of local mean time.

Table IVb gives for 43 Weather Bureau stations the total hourly rainfall for each hour of seventy-fifth meridian time.

Table V gives for 81 stations the mean temperatures for each hour of seventy-fifth meridian time.

Table VI gives for 66 stations the mean pressures for each hour of seventy-fifth meridian time.

Table VII gives for 138 stations the mean hourly movement of the wind.

Table VIII gives for 68 stations the resultant movements and directions of the wind from continuous registration.

Table IX gives for 140 stations the component and resultant directions of the wind based on simultaneous observations at 8 a. m. and 8 p. m., seventy-fifth meridian time.

Table Xa gives for 47 voluntary stations the normals and current departures of mean monthly temperatures.

Table Xb gives for the same stations the similar data as to precipitation.

Table XI gives for each day of the month the number of thunderstorms (T), and of auroras (A), reported by all the observers of each State.

Table XII gives the principal climatic features of the month as reported by each State weather service.

TABLE I.—Climatological data for Weather Bureau Stations, November, 1894.

Districts and stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.				Temperature of the air, in degrees Fahrenheit.						Humidity and precipitation.						Wind.				Mean temperature data since opening of station.									
			Mean pressure, 8 a. m. and 8 p. m. + z.	Mean reduced.	Departure from normal.	Mean max. and min. + z.	Departure from normal.	Maximum.	Date.	Mean minimum.	Date.	Mean maximum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01 or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.			Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.	
																					Miles per hour.	Direction.	Date.									
New England.																																
Eastport.....	76	22	29.88	29.97	-.00	33.2	-3.0	55	3	40	7	30	27	27	73	3.76	-0.5	12	10,096	W.	56	se.	5	8	14	6.5	39.8	1889	29.0	1873		
Portland.....	103	23	29.88	29.99	-.02	34.5	-2.9	58	3	41	10	20	26	26	74	2.05	-2.1	13	6,288	W.	38	se.	3	9	7	14	6.2	43.2	1877	28.9	1873	
Northfield.....	872	23	29.07	30.05	+.01	38.4	-4.6	66	3	36	2	20	21	30	22	76	2.58	-0.5	18	7,508	W.	42	se.	3	6	11	13	6.6	35.8	1889	28.4	1894
Boston.....	135	25	29.93	30.06	-.03	41.6	-3.6	61	3	45	15	30	32	29	29	70	3.10	-1.6	14	8,761	W.	38	se.	3	12	6	12	5.4	44.6	1889	32.8	1873
Nantucket.....	14	9	30.05	30.06	-.00	41.4	-2.9	64	3	47	19	29	37	25	34	73	2.80	-0.7	14	9,869	n.	60	ne.	6	11	7	12	5.9	47.1	1888	41.6	1894
Woods Hole.....	17	.....	.....	.....	.....	41.4	-2.9	64	3	47	17	20	36	25	.....	.....	.....	.....	.....	.....	69	n.	6	11	7	12	5.4	46.9	1881	38.0	1873	
Vineyard Haven.....	19	.....	.....	.....	.....	43.8	-2.6	65	3	51	20	30	37	28	.....	.....	.....	.....	.....	.....	.....	.....	10	7	14	16	.....	.....	.....	43.8	1894	
Block Island.....	27	15	30.04	30.07	+.01	42.3	-3.4	64	3	48	20	29	36	26	35	74	4.81	-0.9	15	13,855	nw.	78	e.	5	11	12	7	5.3	47.8	1881	42.3	1894
Narragansett Pier.....	13	.....	.....	.....	.....	40.3	-2.7	62	3	50	12	30	34	24	.....	.....	.....	.....	.....	.....	.....	.....	16	12	12	12	.....	.....	.....	39.9	1882	
New Haven.....	107	22	29.95	30.07	-.00	37.2	-4.7	64	3	43	15	20	31	21	29	73	4.23	-0.6	13	7,584	n.	38	se.	3	16	5	9	4.7	51.4	1877	33.1	1873
New London.....	45	24	30.05	30.10	+.04	38.6	-5.1	63	3	45	15	20	32	27	33	80	4.75	-0.6	15	6,332	n.	46	se.	3	10	10	10	5.6	45.8	1889	33.7	1873
Mid. Atlantic States.																																
Albany.....	85	21	29.99	30.08	+.01	36.5	-4.1	65	3	43	15	20	36	26	30	81	1.96	-1.1	13	6,033	W.	38	se.	3	9	11	10	6.0	44.0	1883	31.8	1875
New York, N. Y.....	185	25	29.90	30.10	+.03	42.2	-3.5	69	2	49	21	20	35	23	32	72	3.83	-0.1	13	8,575	W.	40	nw.	28	14	7	9	5.0	48.3	1870	37.3	1873
Harrisburg.....	377	7	29.72	30.14	.....	40.0	-2.4	67	2	46	23	20	34	26	32	77	1.90	-1.1	7	6,068	W.	36	W.	3	10	10	10	6.4	47.5	1888	40.0	1894
Philadelphia.....	117	24	30.00	30.13	+.03	42.0	-3.1	69	2	48	22	20	36	22	32	71	3.26	-0.0	13	7,720	nw.	37	nw.	25	14	5	11	4.9	48.0	1877	38.0	1873
Atlantic City.....	53	21	30.08	30.13	+.03	42.9	-3.0	64	3	49	22	29	36	19	36	79	2.38	-1.1	12	9,025	nw.	43	nw.	5	15	6	9	4.6	48.8	1881	40.5	1875
New Brunswick.....	.....	.....	.....	.....	.....	39.9	-.....	70	2	48	18	20	32	33	.....	.....	.....	.....	.....	.....	.....	.....	6	15	9	.....	.....	.....	.....	.....	.....
Baltimore.....	179	24	29.94	30.14	+.02	43.4	-3.7	70	2	50	24	29	37	26	30	64	1.35	-1.2	9	6,213	nw.	38	nw.	25	16	8	6	3.9	49.1	1881	40.6	1873
Washington, D. C.....	112	25	30.04	30.16	+.03	44.0	-2.4	68	2	51	21	29	36	28	32	68	1.52	-1.4	9	5,585	se.	38	nw.	25	19	5	6	3.4	48.0	1890	40.2	1880
Cape Henry.....	21	.....	.....	.....	.....	49.2	-2.9	72	17	57	22	13	41	33	.....	.....	.....	.....	.....	.....	43	nw.	5	17	9	4	3.3	56.0	1881	48.9	1880	
Lynchburg.....	685	24	29.43	30.19	+.05	45.8	-2.4	72	23	56	19	29	36	33	33	68	1.68	-1.5	9	5,536	W.	30	nw.	25	13	14	3	4.0	51.4	1890	40.8	1872
Norfolk.....	57	24	30.11	30.18	+.06	49.4	-2.8	73	3	57	29	29	42	26	40	75	0.86	-2.3	4	6,598	W.	40	nw.	5	15	9	6	4.4	55.0	1881	46.0	1872
S. Atlantic States.																																
Charlotte.....	773	17	29.36	30.20	+.06	48.5	-2.9	73	17	58	24	12	39	28	34	65	1.71	-0.7	4	4,953	W.	26	nw.	5	21	5	4	2.9	55.4	1890	45.1	1880
Hatteras.....	11	14	30.18	30.19	-.08	54.0	-2.2	71	2	59	39	26	49	20	47	78	3.02	-2.1	6	10,040	nw.	47	nw.	5	13	10	7	4.6	59.9	1881	52.3	1882
Kitty Hawk.....	9	20	30.14	30.15	-.07	51.4	-2.3	72	3	57	34	26	46	22	44	76	1.81	-2.2	6	10,078	nw.	48	nw.	5	16	8	6	4.2	57.9	1888	50.1	1892
Raleigh.....	388	8	29.78	30.21	+.04	48.3	-1.5	73	3	57	23	30	39	31	38	73	1.59	-0.6	7	4,601	W.	28	nw.	5	11	13	6	4.5	53.8	1890	46.2	1887
Wilmington.....	78	24	30.12	30.21	+.08	54.1	-2.1	76	2	63	29	29	45	32	44	78	1.97	-0.6	8	5,325	nw.	32	nw.	5	18	4	8	3.4	58.7	1881	51.2	1872
Charleston.....	52	24	30.19	30.24	+.11	57.4	-1.5	76	4	65	33	12	50	32	47	76	3.14	-0.8	7	4,857	nw.	29	ne.	28	15	10	5	3.2	62.2	1890	53.5	1880
Columbia.....	8	.....	.....	.....	.....	52.9	-2.0	77	17	63	27	12	43	32	.....	.....	.....	.....	.....	.....	.....	.....	16	7	7	.....	.....	.....	.....	.....	.....
Augusta.....	209	23	30.03	30.26	+.10	52.1	-3.3	76	16	62	25	12	42	35	40	71	1.82	-1.5	5	2,769	nw.	15	W.	10	19	6	5	3.0	58.8	1890	47.5	1872
Savannah.....	98	24	30.12	30.23	+.08	57.6	-1.6	78	17	66	31	12	49	27	47	77	3.78	-1.6	7	5,244	nw.	38	nw.	24	19	5	6	3.1	61.5	1890	53.3	1872
Jacksonville.....	43	24	30.17	30.22	+.10	61.4	-1.8	82	23	70	33	12	53	29	51	78	3.72	-1.1	8	3,792	n.	24	n.	29	14	7	9	4.3	65.6	.....	56.5	1872
Florida Peninsula.																																
Jupiter.....	28	7	30.13	30.16	.....	71.0	-1.2	84	4	77	48	12	66	20	63	78	2.99	-0.4	11	7,586	ne.	33	ne.	20	7	17	6	5.4	73.7	1890	69.1	1892
Key West.....	22	25	30.12	30.14	+.08	73.6	-0.6	83	19	77	60	12	70	12	66	80	1.04	-1.6	8	9,065	ne.	32	ne.	8	14	11	5	4.4	78.5	1880	71.6	1885
Tampa.....	36	16	30.16	30.20	.....	67.0	+.04	85	22	76	38	12	58	31	59	84	2.26	+.04	5	3,875	n.	19	sw.	3	10	13	7	5.0	69.2	1890	60.0	1886
Titusville.....	44	8	30.16	30.20	.....	66.0	+.04	81	3	73	40	12	59	26	59	82	2.41	-0.8	10	7,185	nw.	36	ne.	29	17	12	1	3.2	69.0	1890	63.0	1892
Eastern Gulf States.																																
Atlanta.....	1,131	17	29.03	30.25	+.08	49.5	-2.3	71	4	58	21	12	41	29	37	70	0.92	-3.1	4	7,442	nw.	35	nw.	5	19	6	5	3.6	57.6	1890	47.7	1880
Pensacola.....	56	16	30.16	30.22	+.09	59.0	-1.4	77	16	68	29	12	51	26	47	70	0.70	-3.7	5	6,052	n.	30	nw.	5	19	6	5	3.3	62.8	1890	56.3	1880
Mobile.....	57	24	30.18	30.25	+.11	57.3	-1.4	78	17	67	29	12	48	29	48	81	0.21	-3.9	4	4,991	n.	26	nw.	5	23	6	1	2.3	62.2	1875	54.0	1872
Montgomery.....	257	23	29.97	30.25	+.09	54.8	-1.9	79	3	66	26	12	44	34	42	70	0.73	-2.9	4	4,267	nw.	32	sw.	23	17	9	4	3.6	60.1	1890	48.0	1872
Meridian.....	358	.....	.....	.....	.....	52.2	-.....	79	23	65	18	12	40	39	39	73	1.34	-.....	3	3,861	n.	38	sw.	23	19	6	5	3.0	.....	.....	.....	.....
Vicksburg.....	254	24	29.94	30.21	+.05	55.5	-1.9	80	16	66	30	12	45	31	40	65	2.36	-2.6	5	4,631	se.	33	nw.	2	20	7	3	2.8	60.4	1890	46.4	1880
New Orleans.....	54	24	30.16	30.22	+.10	60.5	-1.2	79	3	68																						

TABLE I.—Climatological data for Weather Bureau Stations, November, 1894—Continued.

Districts and stations.	Elevation above sea level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.					Mean temperature data since opening of station.											
			Mean pressure, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01 or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.			Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.
																						Miles per hour.	Direction.	Date.								
Up. Miss. Val.—Con.																																
Keokuk	613	24	29.46	30.14	+ .05	36.9	— 4.4	72	15	45	8	19	29	35	25	67	2.24	+ .03	6	6,579	nw.	38	nw.	9	14	5	11	4.8	44.2	1890	31.5	1880
Cairo	359	24	29.78	30.18	+ .07	45.4	— 3.0	73	1	55	20	12	36	31	30	60	1.42	— 2.8	3	7,172	nw.	34	nw.	16	14	7	9	4.3	52.1	1879	37.2	1880
Springfield, Ill.	944	16	29.43	30.14	+ .03	37.8	— 5.4	71	26	47	12	19	29	37	26	66	1.63	— 1.2	4	8,202	nw.	36	nw.	15	9	7	14	5.8	45.6	1885	32.3	1880
Hannibal	534	24	29.55	30.14	+ .03	38.2	— 3.7	76	15	47	10	19	29	36	25	63	1.77	— 1.4	8	7,668	w.	38	sw.	20	10	8	12	5.9	49.6	1883	31.9	1880
Saint Louis	571	24	29.54	30.17	+ .05	42.5	— 1.7	73	26	51	18	19	34	34	28	61	1.49	— 1.4	7	9,604	nw.	46	nw.	2	17	4	9	3.7	49.6	1883	31.9	1880
Missouri Valley.																																
Columbia	963	7	29.13	30.18	+ .06	41.8	— 1.1	74	26	51	13	19	33	35	28	63	1.63	— 0.8	4	7,153	nw.	35	sw.	15	13	4	13	5.3	44.2	1890	39.0	1891
Kansas City	963	7	29.13	30.18	+ .06	41.8	— 1.1	74	26	51	13	19	33	35	28	63	1.63	— 0.8	4	7,153	nw.	35	sw.	15	13	4	13	5.3	44.2	1890	39.0	1891
Springfield, Mo.	1,336	8	28.73	30.19	+ .07	44.8	— 1.4	72	15	55	14	11	34	31	28	59	1.90	— 1.8	4	8,289	nw.	36	nw.	15	15	9	6	3.5	48.2	1890	41.0	1890
Topeka	1,123	24	28.94	30.18	+ .04	43.4	— 1.9	75	3	55	13	11	31	42	22	61	0.35	— 1.2	3	6,237	nw.	28	nw.	15	10	10	10	5.5	43.8	1878	26.4	1880
Omaha	2,613	10	27.34	30.16	+ .05	36.8	— 1.6	74	26	46	6	16	24	52	23	64	0.19	— 0.2	4	8,345	nw.	48	nw.	12	8	15	7	5.5	40.6	1888	29.9	1886
Valentine	1,165	24	28.85	30.15	+ .03	33.4	— 1.6	73	14	50	6	16	24	52	23	64	0.19	— 0.2	4	8,345	nw.	48	nw.	12	8	15	7	5.5	40.6	1888	29.9	1886
Sioux City	1,470	19	28.50	30.12	+ .01	34.2	— 0.6	74	14	46	2	18	22	47	22	67	0.15	— 0.4	3	6,684	nw.	40	nw.	20	9	12	9	5.3	39.0	1890	22.7	1880
Pierre	1,470	19	28.50	30.12	+ .01	34.2	— 0.6	74	14	46	2	18	22	47	22	67	0.15	— 0.4	3	6,684	nw.	40	nw.	20	9	12	9	5.3	39.0	1890	22.7	1880
Huron	1,310	14	28.67	30.14	+ .03	37.7	— 1.0	74	3	42	3	19	19	41	27	74	0.35	— 0.3	7	10,953	nw.	50	se.	28	7	11	12	6.1	34.6	1890	24.2	1891
Northern Slope.																																
Havre	2,477	15	27.37	30.06	— .03	32.8	— 2.0	72	11	44	— 2	18	22	48	21	68	0.57	— 0.1	6	7,636	w.	40	w.	19	7	16	7	5.6	40.6	1890	21.0	1880
Miles City	2,374	17	27.51	30.08	— .01	35.5	— 4.2	72	11	46	— 2	18	25	46	24	69	0.45	— 0.1	6	5,313	s.	36	nw.	8	5	10	15	6.7	38.9	1885	20.4	1880
Helena	4,108	15	25.89	30.14	— .00	41.0	— 8.4	71	11	49	9	16	33	35	25	55	0.24	— 0.3	3	6,150	sw.	52	w.	19	9	12	9	5.5	41.0	1894	19.3	1880
Rapid City	3,280	9	26.65	30.11	— .03	37.8	— 2.0	79	14	50	— 3	16	25	53	22	59	0.34	— 0.0	7	7,212	w.	44	nw.	12	9	16	5	5.1	42.1	1890	31.0	1888
Cheyenne	6,105	24	24.07	30.17	+ .02	41.0	— 5.6	68	14	53	— 3	16	29	46	15	42	0.08	— 0.2	4	9,893	nw.	50	nw.	19	11	17	2	4.0	41.0	1894	23.1	1880
Lander	5,377	12	24.73	30.23	— .01	36.8	— 1.7	72	11	54	— 14	16	19	47	17	56	0.37	— 0.2	2	3,091	sw.	55	sw.	19	13	15	2	4.0	36.8	1894	10.1	1880
North Platte	2,841	21	27.17	30.21	+ .05	41.0	— 2.1	78	14	53	10	17	25	54	23	62	0.01	— 0.4	1	9,983	nw.	42	nw.	12	6	21	3	5.0	39.7	1876	24.0	1880
Middle Slope.																																
Denver	5,287	23	24.84	30.19	+ .01	44.8	— 4.8	75	14	59	5	16	31	43	14	37	0.22	— 0.5	2	5,595	s.	60	ne.	15	16	9	5	3.8	44.8	1894	22.0	1880
Pueblo	4,734	7	25.30	30.21	— .06	43.6	— 2.9	81	14	61	12	17	26	59	17	43	0.06	— 0.2	1	4,788	nw.	52	n.	15	18	8	4	3.5	43.6	1894	33.0	1889
Concordia	1,410	10	26.65	30.20	+ .06	41.4	— 0.3	79	12	51	10	11	28	46	23	58	0.02	— 1.4	2	5,714	n.	28	n.	30	22	6	2	3.0	44.6	1890	35.6	1889
Dodge City	2,523	21	27.51	30.20	+ .07	44.4	— 2.1	83	12	59	10	17	30	48	19	47	0.03	— 0.5	2	7,440	ne.	43	n.	15	21	6	3	3.3	45.2	1885	26.2	1880
Wichita	1,366	7	28.70	30.19	— .01	46.0	— 2.5	82	12	58	10	17	33	48	23	50	0.01	— 1.0	1	7,302	n.	43	n.	16	21	2	7	3.0	46.0	1894	39.4	1889
Oklahoma	1,239	28	28.86	30.20	— .01	49.8	— 2.1	79	15	62	9	17	38	38	31	57	0.07	— 0.7	2	7,204	s.	45	n.	16	24	5	1	1.8	46.0	1894	39.4	1889
Southern Slope.																																
Abilene	1,749	10	28.36	30.22	+ .08	55.8	— 2.1	79	22	68	23	17	44	35	33	50	0.00	— 2.7	0	7,256	sw.	36	nw.	1	23	7	0	1.5	56.2	1885	47.8	1889
Amarillo	3,691	20	26.37	30.19	— .01	48.0	— 1.8	79	15	61	17	17	35	40	19	41	0.00	— 0.0	0	12,097	nw.	38	nw.	15	3	7	0	1.9	56.2	1885	47.8	1889
Northern Plateau.																																
El Paso	3,813	17	26.33	30.24	+ .09	54.0	— 1.9	78	4	72	26	17	36	45	18	32	0.00	— 0.6	0	5,624	nw.	47	nw.	1	27	3	0	0.7	57.3	1878	46.3	1880
Santa Fe	7,051	21	23.39	30.21	+ .08	43.2	— 5.1	62	6	55	18	17	32	30	12	32	0.00	— 0.9	0	4,187	se.	25	n.	1	25	5	0	1.8	43.2	1894	29.6	1880
Tucson	2,399	11	27.59	30.07	— .08	62.5	— 5.5	62	6	82	35	18	43	45	27	33	0.00	— 0.5	0	3,000	s.	20	n.	14	28	2	0	1.4	62.5	1894	53.6	1881
Yuma	1,410	20	29.86	30.01	— .01	68.3	— 1.3	92	6	84	45	15	53	40	34	34	0.00	— 0.3	0	3,500	ne.	20	n.	16	24	5	1	1.5	68.3	1894	56.7	1880
Middle Plateau.																																
Carson City	4,720	7	25.46	30.26	— .06	44.4	— 2.7	70	14	62	12	30	26	50	18	38	0.21	— 1.7	2	5,522	se.	24	nw.	15	12	10	8	4.4	40.8	1894	34.5	1893
Winnemucca	4,340	16	25.83	30.26	+ .06	41.8	— 4.6	71	8	59	6	16	24	48	16	37	0.05	— 0.6	1	6,032	e.	36	n.	27	13	11	6	4.3	42.1	1885	30.0	1880
Salt Lake City	4,345	21	25.83	30.29	+ .06	45.6	— 5.6	64	26	56	19	16	35	29	28	54	0.25	— 1.2	1	3,187	se.	24	nw.	21	17	9	4	3.2	45.6	1894	30.3	1880
Northern Plateau.																																
Baker City	3,430	6	26.60	30.19	— .01	40.8	— 6.4	64	8	51	6	16	31	31	28	65	0.04	— 0.1	2	5,522	se.	24	nw.	15	12	10	8	4.4	40.8	1894	34.5	1893
Idaho Falls	4,742	5	25.38	30.26	— .06	41.8	— 4.6	71	8	59	6	16	24	48	16	37	0.05	— 0.6	1	6,032	e.	36	n.	27	13	11</						

TABLE I a.—Temperature of the wet-bulb thermometer, November, 1894.

Number.	Station.	8 A. M.			8 P. M.			Number.	Station.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.			Max.	Min.	Mean.	Max.	Min.	Mean.
New England.															
1	Eastport, Me.	46	8	32	52	10	32	70	Chicago, Ill.	51	10	30	48	19	33
2	Portland, Me.	52	11	31	47	12	32	71	Milwaukee, Wis.	49	5	28	42	13	30
3	Northfield, Vt.	52	9	26	44	6	28	72	Green Bay, Wis.	45	1	26	39	11	28
4	Boston, Mass.	56	15	33	50	15	45	73	Duluth, Minn.	39	— 7	22	39	1	26
5	Nantucket, Mass.	54	16	39	53	21	39		North Dakota.						
6	Woods Hole, Mass.	60	18	40	59	22	40	74	Moorhead, Minn.	58	— 13	19	45	— 2	23
7	Block Island, R. I.	60	18	40	59	22	40	75	St. Vincent, Minn.	37	— 22	16	40	— 8	20
8	New Haven, Conn.	58	16	33	54	18	35	76	Bismarck, N. Dak.	41	— 7	21	46	— 2	25
9	New London, Conn.	59	16	36	55	20	37	77	Williston, N. Dak.	40	— 10	21	41	0	25
Middle Atlantic States.															
10	Albany, N. Y.	58	14	33	49	17	34	78	Upper Mississippi Valley.						
11	New York, N. Y.	60	20	36	56	24	38	79	St. Paul, Minn.	39	— 8	23	44	5	27
12	Harrisburg, Pa.	49	22	35	53	26	38	80	La Crosse, Wis.	38	2	24	44	11	30
13	Philadelphia, Pa.	61	22	36	54	24	38	81	Davenport, Iowa.	41	6	27	46	17	32
14	Atlantic City, N. J.	61	23	39	58	25	40	82	Des Moines, Iowa.	40	7	27	46	14	32
15	Baltimore, Md.	52	23	36	54	26	38	83	Keokuk, Iowa.	41	7	29	49	18	33
16	Washington, D. C.	54	22	37	55	25	39	84	Cairo, Ill.	54	22	35	60	25	41
17	Lynchburg, Va.	58	19	37	58	28	42	85	Springfield, Ill.	54	12	30	54	20	35
18	Norfolk, Va.	67	28	43	64	30	45	86	Hannibal, Mo.	44	9	30	54	21	35
South Atlantic States.															
19	Charlotte, N. C.	62	73	39	61	28	43	87	St. Louis, Mo.	54	16	33	57	22	36
20	Hatteras, N. C.	69	37	50	66	36	51	88	Missouri Valley.						
21	Kittyhawk, N. C.	67	33	47	62	35	48	89	Columbia, Mo.	43	11	32	52	19	36
22	Raleigh, N. C.	64	23	41	65	31	44	90	Kansas City, Mo.	55	14	33	58	24	39
23	Wilmington, N. C.	70	31	49	68	34	50	91	Springfield, Mo.	43	9	28	47	14	33
24	Charleston, S. C.	68	32	49	68	37	53	92	Omaha, Nebr.	43	9	28	47	14	33
25	Augusta, Ga.	64	26	52	67	32	48	93	Valentine, Nebr.	44	6	27	50	10	33
26	Savannah, Ga.	69	30	49	70	36	53	94	Sioux City, Iowa.	42	5	25	43	7	30
27	Jacksonville, Fla.	68	31	53	69	39	57		Pierre, S. Dak.	46	7	25	50	8	32
Florida Peninsula.															
28	Jupiter, Fla.	75	46	66	75	52	66	95	Huron, S. Dak.	43	4	23	44	4	27
29	Key West, Fla.	76	53	68	76	57	69	96	Northern Slope.						
30	Tampa, Fla.	72	38	59	74	44	63	97	Havre, Mont.	45	0	25	46	4	30
31	Titusville, Fla.	73	39	60	73	43	62	98	Miles City, Mont.	47	3	27	51	12	33
Eastern Gulf States.															
32	Atlanta, Ga.	59	21	40	64	28	45	99	Helena, Mont.	48	11	32	48	12	33
33	Pensacola, Fla.	67	29	50	68	35	54	100	Rapid City, S. Dak.	45	1	29	42	15	32
34	Mobile, Ala.	67	28	48	67	30	54	101	Cheyenne, Wyo.	40	1	29	42	15	32
35	Montgomery, Ala.	61	24	44	66	23	50	102	Lander, Wyo.	37	— 7	23	40	8	30
36	Meridian, Miss.	66	25	41	66	29	48	103	North Platte, Nebr.	44	10	25	49	12	35
37	Vicksburg, Miss.	64	30	45	64	35	50	104	Middle Slope.						
38	New Orleans, La.	68	33	52	70	40	55	105	Denver, Colo.	43	8	29	45	11	37
Western Gulf States.															
39	Shreveport, La.	63	30	44	65	38	50	106	Pueblo, Colo.	40	13	25	45	23	38
40	Fort Smith, Ark.	50	22	37	61	32	46	107	Concordia, Kans.	42	13	28	48	18	36
41	Little Rock, Ark.	55	25	38	62	32	46	108	Dodge City, Kans.	40	15	28	46	18	36
42	Corpus Christi, Tex.	70	34	56	72	49	63	109	Wichita, Kans.	46	10	31	50	21	39
43	Galveston, Tex.	68	37	56	70	46	60	110	Oklahoma, Okla.	58	10	36	62	24	44
44	Palentine, Tex.	64	29	46	66	39	52	111	Southern Slope.						
45	San Antonio, Tex.							112	Abilene, Tex.	58	23	40	60	30	47
Ohio Valley and Tennessee.															
46	Chattanooga, Tenn.	59	20	38	60	25	43	113	Amarillo, Tex.	46	16	30	58	32	40
47	Knoxville, Tenn.	60	22	35	58	26	42	114	Southern Plateau.						
48	Memphis, Tenn.	57	24	39	61	29	45	115	El Paso, Tex.	40	23	31	47	38	44
49	Nashville, Tenn.	57	14	35	61	24	43	116	Santa Fe, N. Mex.	35	17	28	42	24	34
50	Lexington, Ky.	55	17	33	56	22	38		Tucson, Ariz.	45	30	38	56	45	51
51	Louisville, Ky.	48	18	33	56	23	39	117	Yuma, Ariz.	50	40	46	64	47	54
52	Indianapolis, Ind.	49	18	32	55	24	37	118	Middle Plateau.						
53	Cincinnati, Ohio	47	19	34	56	23	38	119	Carson City, Nev.	40	16	27	46	30	41
54	Columbus, Ohio	50	18	32	54	22	36	120	Winnemucca, Nev.	36	9	26	49	26	39
55	Pittsburg, Pa.	53	22	34	52	23	37		Salt Lake City, Utah	40	19	34	48	26	40
56	Parkersburg, W. Va.	55	18	34	60	24	40	121	Northern Plateau.						
Lower Lake Region.															
57	Buffalo, N. Y.	52	16	32	50	20	34	122	Baker City, Oreg.	46	7	31	48	24	38
58	Oswego, N. Y.	48	16	32	50	17	33	123	Idaho Falls, Idaho	40	5	27	45	20	36
59	Rochester, N. Y.	49	17	31	50	14	33	124	Spokane, Wash.	47	24	37	51	29	40
60	Erie, Pa.	52	21	33	51	25	35	125	Walla Walla, Wash.	50	24	42	57	32	45
61	Cleveland, Ohio	46	20	32	48	22	34	126	North Pacific Coast Region.						
62	Sandusky, Ohio	44	19	32	50	23	35	127	Fort Canby, Wash.	54	34	47	57	39	48
63	Toledo, Ohio	44	17	30	53	21	34	128	Port Angeles, Wash.	49	30	42	52	34	44
64	Detroit, Mich.	46	16	30	50	18	33	129	Seattle, Wash.	55	31	44	57	37	46
Upper Lake Region.															
65	Alpena, Mich.	45	9	28	51	12	30	130	Tatoosh Island, Wash.	50	36	45	52	38	48
66	Grand Haven, Mich.	47	16	31	46	19	33	131	Portland, Oreg.	55	32	44	58	38	50
67	Marquette, Mich.	40	0	26	39	5	27	132	Roseburg, Oreg.	50	28	42	58	38	50
68	Port Huron, Mich.	45	16	29	56	15	32	133	Middle Pacific Coast Region.						
69	Sault Ste. Marie, Mich.	40	— 5	25	48	11	26	134	Eureka, Cal.	52	40	46	58	44	50
									Red Bluff, Cal.	51	35	45	61	46	54
									Sacramento, Cal.	52	36	46	61	46	55
									San Francisco, Cal.	56	46	52	61	48	54
									South Pacific Coast Region.						
									Fresno, Cal.	52	36	44	61	42	55
									Los Angeles, Cal.	53	41	47	59	52	55
									San Diego, Cal.	54	47	51	58	53	55
									San Luis Obispo, Cal.	55	35	47	61	48	54

TABLE II.—Meteorological record of voluntary and other co-operating observers, November, 1894.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
Alabama.				Ins.	Arkansas—Cont'd.				Ins.
Alec	80	22	55.2	.....	Forrest f.	79	23	52.4	0.58
Ashville *	78	16	48.2	.....	Fulton f.	.....	.....	.....	.....
Bermuda f.	77	20	54.6	0.55	Gaines Landing	.....	.....	.....	0.10
Brewton	85	19	55.0	.....	Helena a f.	.....	.....	.....	1.32
Carrollton * f.	74	22	51.1	0.53	Helena b f.	78	22	53.8	1.15
Citronelle f.	76	32	58.2	0.03	Hot Springs a	80	22	51.7	1.50
Citronelle Landing f.	.....	.....	.....	0.25	Hot Springs b	.....	.....	.....	1.25
Collinsville *	78	28	54.2	0.62	Hot Springs (near)	.....	.....	.....	1.25
Cordova f.	.....	.....	.....	0.36	Keesees Ferry f.	77	16	47.5	1.31
Daphne f.	82	20	54.0	.....	Kirby f.	75	25	50.8	2.55
Decatur f.	73	12	47.7	0.70	Lonoke *	73	26	52.7	0.62
Demopolis	.....	.....	.....	1.01	Luna Landing *	80	30	53.7	.....
Eufaula f.	78	26	55.6	0.82	Malvern f.	78	24	52.2	0.95
Eufaula c f.	.....	.....	.....	0.76	Mount Nebo f.	65	22	48.1	2.00
Evergreen f.	77	22	54.4	0.63	New Gascony *	74	27	50.0	0.84
Florence a f.	.....	.....	.....	0.83	Newport a f.	.....	.....	.....	0.98
Florence b f.	74	16	47.6	.....	Newport b f.	76	20	49.9	0.58
Fort Deposit f.	79	24	54.6	0.55	Newport c f.	75	16	48.0	0.88
Gadsden f.	79	19	50.0	1.27	Osceola f.	77	22	49.0	0.45
Greensboro f.	73	21	51.5	1.03	Ozark f.	74	25	51.3	3.28
Healing Springs f.	80	16	50.4	0.52	Pine Bluff f.	76	26	53.0	0.84
Highland Home f.	82	25	55.1	0.38	Pocahontas f.	75	12	45.6	0.62
Jasper f.	73	12	46.6	0.52	Prescott f.	80	28	54.1	1.20
Lock No. 4	.....	.....	.....	0.95	Rison f.	77	22	50.2	1.39
Madison Station f.	74	16	49.4	0.73	Rogers f.	74	17	47.8	1.05
Maple Grove f.	79	16	52.6	1.08	Russellville f.	74	24	49.2	2.40
Marion f.	76	34	57.2	1.05	Searcy f.	78	29	53.6	0.35
Mount Willing f.	77	24	54.2	1.05	Stuttgart f.	76	21	50.5	0.80
Newbern f.	77	21	52.6	1.49	Texarkana f.	78	28	54.8	0.45
Newburg f.	79	11	49.2	1.35	Washington f.	76	30	52.0	1.50
Oneonta f.	70	11	45.3	.....	Winslow f.	70	18	46.8	2.25
Opelika f.	76	24	53.7	0.72	California.				
Oxanna * f.	81	17	49.6	1.30	Adin	74	20	45.6	0.02
Pine Apple f.	78	20	49.4	0.39	Ager	66	20	44.6	0.51
Pushmataha f.	80	27	53.6	0.78	Agnew	80	32	56.2	0.61
Rock Mills f.	79	19	49.4	0.67	Anaheim *	85	41	55.5	0.00
Scottsboro	75	14	49.2	0.46	Antioch *	78	42	57.4	0.38
Selma f.	.....	.....	.....	0.99	Aptos *	75	36	51.1	0.71
Thomasville	81	23	54.6	0.26	Arlington Heights	95	35	63.0	0.00
Tuscaloosa f.	77	19	49.2	1.03	Athlone *	80	35	60.0	0.30
Tuscumbia f.	74	16	49.3	1.00	Auburn *	82	40	61.2	1.09
Union f.	79	17	53.0	0.79	Bakersfield *	78	40	58.8	0.00
Union Springs f.	78	22	53.2	0.96	Ballast Point L. H.	.....	.....	.....	0.00
Uniontown *	79	27	54.0	0.94	Barstow f.	85	25	55.3	0.00
Valley Head f.	71	13	46.6	0.78	Bear Valley f.	.....	.....	.....	1.25
Wetumpka	.....	.....	.....	0.88	Beaumont *	89	38	61.0	0.00
Arizona.					Belmont *	75	46	60.3	0.28
Benson a *	81	46	62.7	0.00	Berendo *	80	40	60.0	0.34
Benson b f.	80	26	55.0	0.00	Berkeley	74	45	57.4	1.35
Buckeye f.	91	33	62.4	0.00	Bethany *	80	40	57.1	0.34
Calabasas f.	82	28	55.2	0.00	Bishop Creek *	81	24	54.4	0.00
Casa Grande *	88	47	65.0	0.00	Boca *	85	5	44.5	0.50
Dragon Summit *	87	45	66.6	0.00	Borden *	80	38	58.8	0.30
Eagle Pass *	.....	.....	.....	0.00	Boulder Creek *	84	32	56.8	1.76
Farley Camp *	.....	.....	.....	0.00	Brentwood *	76	37	53.5	0.32
Flagstaff	71	13	42.6	0.00	Byron *	76	34	54.9	0.26
Fort Apache	74	21	48.2	0.00	Caliente *	78	38	57.4	0.25
Fort Grant	81	36	59.3	0.00	Calistoga *	84	32	53.9	1.09
Fort Huachuca	78	38	57.3	0.00	C. Mendocino L. H.	.....	.....	.....	2.55
Gila Bend *	97	49	66.1	0.00	Capitola *	76	40	54.5	0.75
Globe f.	79	35	58.2	0.00	Castroville *	76	39	57.1	0.75
Holbrook f.	72	17	45.2	0.00	Cedarville f.	68	12	44.7	0.00
Keams Canyon f.	73	15	45.5	0.00	Centerville *	82	42	59.4	0.84
Lochiel	74	35	52.9	0.00	Chico *	90	33	58.5	0.73
Maricopa *	100	39	66.0	0.00	Chino *	89	36	57.7	0.00
Mount Huachuca f.	74	36	57.0	0.00	Cisco *	66	20	45.3	0.00
Natural Bridge f.	.....	.....	.....	0.00	Claremont f.	88	37	60.5	0.00
Navajo *	70	28	49.9	0.00	Cloverdale f.	79	44	61.9	1.91
Oracle f.	76	42	60.5	0.00	Colfax *	94	33	59.2	0.00
Oro	.....	.....	.....	0.00	Colton *	92	28	56.4	0.00
Pantano *	86	47	63.1	0.00	Corning *	86	38	59.6	0.00
Parker	95	32	67.7	0.00	Crescent City f.	75	32	51.2	4.74
Payson	.....	.....	.....	0.00	Crescent City L. H.	.....	.....	.....	5.07
Peoria f.	84	41	62.0	0.00	Crofton *	89	47	63.8	0.00
Phoenix b f.	85	36	61.6	0.00	Davisville a *	82	35	60.0	0.35
Red Rock	88	32	60.0	0.00	Deep Creek	.....	.....	.....	0.00
Reymert f.	93	43	67.0	0.00	Delano *	81	39	57.9	0.00
San Carlos	85	25	54.4	0.00	Delta *	72	37	54.6	3.30
San Simon *	85	40	60.6	0.00	Dinuba *	74	41	55.5	0.08
Show Low	.....	.....	.....	0.00	Downey *	94	40	63.6	0.00
Signal f.	85	36	60.9	0.00	Dry Creek * f.	.....	.....	.....	1.10
Sulphur Spr'g Val f.	.....	.....	.....	0.00	Drytown	77	33	56.6	0.28
Texas Hill *	92	42	65.3	0.00	Dunnigan *	84	38	57.9	2.90
Tucson b *	85	50	68.6	0.00	Dunsmuir *	68	30	45.0	0.00
Tucson c f.	90	35	64.0	0.00	East Brother L. H.	62	24	43.7	0.82
Walnut Ranch * f.	74	32	51.9	0.00	Edgwood *	69	25	45.5	2.26
Whipple Barracks	76	22	49.6	0.00	Edmonton *	82	35	58.7	1.05
Willcox *	82	37	50.0	0.00	Eldorado *	89	38	60.7	0.00
Yuma *	78	42	64.3	0.00	Elk Grove *	85	36	56.7	0.51
Arkansas.					El Verano *	77	35	54.6	1.53
Arkadelphia f.	.....	.....	.....	1.14	Emigrant Gap *	64	23	49.2	0.90
Arkansas City f.	.....	.....	.....	0.00	Escondido	88	33	57.6	0.00
Bee Branch f.	81	21	50.0	1.30	Evergreen	.....	.....	.....	0.80
Blanchard Springs f.	78	23	50.0	0.82	Exeter *	92	42	60.0	0.11
Brinkley f.	78	22	52.6	0.38	Fall Brook *	87	37	54.4	0.72
Camden a f.	.....	.....	.....	1.33	Farmington *	80	33	54.7	0.72
Camden b f.	81	25	50.3	1.38	Felton *	88	32	57.6	0.70
Conway *	73	25	47.7	1.17	Fernando *	92	34	60.3	0.00
Corning f.	75	14	44.2	0.64	Florence *	85	42	64.3	0.00
Dallas * f.	72	24	49.8	1.15	Folsom City a *	79	38	54.8	1.03
Dardanelle f.	.....	.....	.....	2.00	Folsom City b *	78	39	56.0	0.89
Payettville f.	72	15	49.2	1.93	Fordyce Dam f.	.....	.....	.....	1.25

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
California—Cont'd.	°	°	°	Ins.	California—Cont'd.	°	°	°	Ins.
Fort Ross	.....	.....	.....	1.40	Orland *	88	38	58.8	0.43
Fremontville *	82	36	54.7	0.00	Ormonde f.	.....	.....	.....	1.44
Fresno *	78	50	62.0	0.18	Oroville a *	85	41	63.4	1.07
Fruto *	85	40	60.6	0.55	Oroville b	88	35	60.6	1.05
Galt *	80	38	56.9	0.70	Pajaro *	87	30	55.8	0.75
Georgetown f.	78	31	57.2	1.53	Palermo f.	75	34	53.7	1.07
Gilroy *	85	32	56.5	0.24	Palm Springs *	98	42	68.4	0.00
Girard *	80	35	54.9	0.15	Pasadena f.	87	37	61.2	0.01
Glen Ellen *	80	32	52.3	1.45	Paso Robles a *	85	30	59.8	0.07
Gorman Station f.	.....	.....	.....	0.00	Paso Robles b	81	30	55.0	0.09
Goshen *	82	36	59.5	T.	Piedras Blancas L.H.	.....	.....	.....	0.84
Grass Valley a	.....	.....	.....	1.38	Pigeon Point L. H.	.....	.....	.....	0.56
Green Valley	.....	.....	.....	0.00	Pilot Creek	.....	.....	.....	1.81
Greenville * f.	75	12	38.6	1.49	Placerville a *	83	30	55.9	1.20
Haywards *	74	41	55.4	0.78	Placerville b	74	36	50.2	1.05
Healdsburg *	82	32	57.3	1.10	Pleasanton a *	88	34	54.9	0.46
Hendersons Ranch	.....	.....	.....	0.00	Pleasanton b	77	28	51.8	0.55
Hollister *	84	40	58.4	0.29	Pt. Ano Nuevo L. H.	.....	.....	.....	1.00
Hornbrook *	68	22	42.6	0.70	Point Arena L. H.	.....	.....	.....	1.15
Hueneme	.....	.....	.....	0.09	Point Bonita L. H.	.....	.....	.....	0.94
Humboldt L. H.	.....	.....	.....	2.14	Pt. Conception L. H.	.....	.....	.....	0.20
Huron *	90	40	59.7	0.00	Point Fermin L. H.	.....	.....	.....	0.00
Hydesville f.	72	30	52.8	3.10	Pt. Hueneme L. H.	.....	.....	.....	0.03
Independence f.	81	24	54.7	0.00	Point Lobos	72	45	56.0	0.68
Indio a *	104	46	70.5	0.00	Point Loma L. H.	.....	.....	.....	0.00
Ione *	76	32	56.5	0.96	Point Montara L. H.	.....	.....	.....	0.97
Jackson	83	37	58.7	1.48	Point Pinos L. H.	.....	.....	.....	0.50
Jolon	72	33	55.1	1.10	Point Reyes L. H.	.....	.....	.....	1.04
Julian f.	82	32	58.1	0.30	Point Sur L. H.	.....	.....	.....	0.41
Keeler *	89	36	58.1	0.00	Pomona *	86	37	57.8	0.00
Keene *	80	54	57.2	0.30	Pomona (near)	91	40	62.2	0.00
Kennedy Gold	.....	.....	.....	0.00	Porterville *	83	40	59.2	0.04
Kernville	76	35	57.4	1.40	Port Los Angeles *	63	49	55.8	0.04
King City *	86	32	60.6	0.25	Poway	.....	.....	.....	0.00
Kingsburg *	80	35	59.6	0.07	Puente *	90	36	59.5	0.00
Knights Landing *	79	31	52.2	0.70	Ravenna *	85	38	61.1	0.00
Kono Tayee	72	40	55.6	0.74	Red Bluff *	84	46	59.0	1.00
Lagrange *	87	37	60.4	0.60	Redding a *	88	40	58.1	0.99
La Porte * f.	72	25	44.6	1.32	Redding b	85	38	58.6	1.01
Lathrop *	78	35	56.2	0.70	Redlands	.....	.....	.....	0.00
Laurel *	85	38	57.7	1.68	Redlands b *	87	42	62.1	0.00
Lee Moore *	79	35	55.5	0.00	Reedley (near) * 1	80	38	58.8	0.45
Lick Observatory f.	77	34	57.5	0.84	Represa	76	37	54.0	0.90
Lime Point L. H.	.....	.....	.....	0.56	Rio Vista	78	37	57.0	0.53
Little Bear Valley.	.....	.....	.....	0.00	Riverside f.	98	32	61.5	0.00
L. Bear Val. (near).	.....	.....	.....	0.00	Rocklin *	78	39	57.1	1.00
Livermore *	79	37	56.7	0.50	Roe Island L. H.	.....	.....	.....	0.41
Livingston *	76	37	61.1	0.30	Rosewood *	79	37	56.4	0.79
Lodi	76	35	55.1	0.73	Sacramento a	76	36	56.8	0.60
Long Beach *	81	43	58.6	0.30	Sacramento b *	72	38	54.3	0.59
Los Alamos	.....	.....	.....	0.30	Sacramento c *	83	40	58.3	0.59
Los Angeles *	85	40	58.5	0.00	Salinas *	80	38	53.0	0.45
Los Banos *	69	34	52.9	0.13	Salton *	94	52	68.3	0.00
Los Gatos a *	84	34	57.1	0.70	San Ardo a *	90	34	56.8	0.03
Los Gatos b	71	30	54.4	0.75	San Gabriel *	92	38	58.6	0.00
L. Holcomb Valley.	.....	.....	.....	0.00	Sanger Junction *	87	35	64.2	0.40
Mammoth Tank *	92	40	65.5	0.00	San Jacinto f.	93	31	61.6	0.00
Manzana	76	34	57.2	0.61	San Jose a *	76	40	57.0	0.55
Mare Island L. H.	.....	.....	.....	0.61	San Jose b	77	27	52.0	0.75
Mariposa *	79	35	52.2	0.73	San Leandro * 1	85	44	59.3	1.07
Martinez *	70	40	62.0	0.04	San Luis L. H.	.....	.....	.....	0.45
Marysville *	73	40	54.4	0.80	San Luis Obispo a	79	44	58.8	0.00
Mendota *	75	40	55.5	0.00	San Mateo *	77	42	57.6	0.72
Menlo Park *	75	38	55.5	0.46	San Miguel *	84	31	56.8	0.21
Merced *	80	35	56.4	0.15	San Miguel Island f.	74	43	57.0	0.30
Middletown * f.	84	30	51.6	1.92	San Pedro *	81	46	60.4	0.00
Mills College	.....	.....	.....	1.01	San Rafael f.	78	37	56.5	0.72
Milton *	75	34	54.7	0.95	Santa Ana *	78	40	58.5	0.74
Millton (near) *	80	43	60.9	1.23	Santa Barbara a	76	44	57.4	0.07
Modesto *	81	44	63.0	0.28	Santa Barbara b *	78	51	61.2	0.11
Mohave *	81	35	58.3	T.	Santa Barbara L. H.	.....	.....	.....	0.08
Mokelumne Hill *	.....	.....	.....	1.12	Santa Clara a *	77	38	55.6	0.55
Montague *	68	39	46.9	0.54	Santa Clara b	87	33	57.5	0.42
Monterey *	72	38	54.6	0.32	Santa Cruz a *	82	38	57.2	0.41
Monterey (Hotel	.....	.....	.....	0.00	Santa Cruz b f.	83	39	56.7	0.40
del Monte) *	74	40	55.0	.....	Santa Cruz L. H.	.....	.....	.....	0.42
Morses House	.....	.....	.....	0.00	Santa Margarita *	82	28	52.8	0.33
Mountain View	.....	.....	.....	0.37	Santa Maria	83	36	57.6	0.07
Mount Glenwood *	82	42	60.3	0.41	Santa Monica *	64	38	53.0	0.00
Muth Flat	.....	.....	.....	0.00	Santa Paula a *	.....	.....	.....	0.00
Napa *	86	32	51.0	1.35	Santa Paula b f.	85	32	51.2	0.00
Napa b	80	30	56.2	1.34	Santa Rosa *	77	36	54.2	0.89
National City f.	88	39	58.0	0.00	Santicoy f.	.....	.....	.....	0.00
Needles *	88	40	62.2	0.00	Selma *	80	37	56.0	0.05
Neenach *	83	30	55.2	0.00	Shasta Springs f.	74	20	46.8	2.95
Nevada City f.	78	29	52.1	1.38	Shingle Springs *	73	32	53.6	0.99
New Almaden *	82	41	58.2	0.42	Slisson *	70	19	43.9	1.70
Newark *	72	40	56.9	0.73	Soladad *	86	34	57.3	0.00
Newcastle a f.	78	36	58.3	1.25	S.E. Farallone L.H.	.....	.....	.....	0.50
Newcastle b *	75	35	56.7	0.95	South Vallejo *	65	48	55.0	0.59
Newhall *	93	28	58.3	0.00	Spadra *	90	35	59.5	0.00
Newman *	75	35	55.6	0.00	Squirrel Inn	.....	.....	.....	0.00
Niles *	78	40	55.2	1.25	Stanford Univer'y.	78	37	56.4	0.40
Nordhoff f.	96	32	63.1	0.00	Stockton a	76	36	55.6	0.56
Norwalk *	84	38	57.3	0.00	Stockton b *	80	40	57.2	0.00
Oakdale a *	78	30	51.3	0.67	Suisun City *	84	36	59.4	0.53
Oakdale b *	80	33	54.8	0.65	Summerdale f.	.....	.....	.....	1.00
Oakland a	73	42	55.9	1.34	Summit *	61	11	41.7	.....
Oakland b *	72	43	55.7	0.30	Susanville * f.	68	25	45.7	0.40
Ogilby *	92	54	71.9	0.00	Sutter Creek *	74	28	51.4	1.10
Oleta *	76	33	51.2	1.37	Tehachapi a *	80	37	59.8	0.00
Ontario a *	88	38	60.1	0.00	Tehama *	88	35	63.1	0.00
Ontario b	88	38	61.0	0.00	Templeton *	83	31	54.7	0.11
					Towles *	78	28	53.3	1.60

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip. in.	Stations.	Temperature. (Fahrenheit.)			Precip. in.
	Max.	Min.	Mean			Max.	Min.	Mean	
California—Cont'd.					Colorado—Cont'd.				
Tracy ⁸⁸	78	36	57.1	0.36	Vernon ⁸	82	3	47.8	0.12
Traver ⁸⁸				0.00	Vilas ⁸				0.00
Trinidad L. H.				2.20	Watkins ⁸¹	62	10	41.8	
Tropico ⁸⁸	86	40	59.1	0.00	Yuma ⁸				0.22
Truckee ⁸⁸	66	10	38.8	0.60	Connecticut.				
Tulare ⁸⁸	83	36	57.3	0.00	Bridgeport ⁸¹	62	16	38.3	5.85
Tulare ⁸⁸				0.06	Canton	61	7	35.8	3.55
Tunnel No. 2.	94	32	61.0	0.20	Colchester	67	11	35.7	4.51
Turlock ⁸⁸	82	37	60.5	0.32	Falls Village				4.15
Turlock ⁸⁸	83	31	54.8	0.36	Greenfield Hill				5.41
Ukiah ⁸⁸	80	30	53.0	1.37	Hartford b.				4.72
Vacaville ⁸¹	84	40	59.5	0.63	Hartford c.	62	16	36.2	
Vacaville ⁸⁸	86	38	59.4	0.45	Lake Konomoc				4.98
Valley Springs ⁸⁸	83	37	64.9	1.20	Middletown	64	13	36.8	5.72
Ventura ⁸⁸	75	39	54.4	T.	New Hartford a ⁸¹	68	8	36.1	4.04
Vina ⁸⁸	83	39	57.9	0.65	N. Grosvener Dale	63	9	33.4	3.89
Volcano Springs ⁸⁸	96	44	72.9	0.00	Norwalk	61	13	32.0	5.55
Walnut Creek	81	33	56.2	0.50	Southampton ⁸¹	61	13	34.9	4.50
West Butte				0.48	South Manchester				4.29
Westley ⁸⁸	79	40	59.3	0.23	Storrs	64	8	34.1	4.00
West Point f.				5.20	Thompson ⁸	60	11		
Wheatland	84	35	58.4	0.77	Voluntown ⁸	63	7	35.6	4.45
Whittier ⁸⁸	95	40	68.0	0.00	Wallingford f.				6.86
Williams ⁸⁸	84	36	56.6	0.18	Waterbury	63	14	37.0	4.30
Willows ⁸⁸	81	40	59.7	0.07	West Simsbury				4.16
Wilmington ⁸⁸	76	47	61.3	0.00	Windsor	61	13	34.5	4.12
Winchester f.	96	36	66.1	0.00	Delaware.				
Winters ⁸⁸	84	38	54.8	0.44	Dover f.	68	24	42.6	2.88
Wire Bridge ⁸⁸	78	33	54.6	1.17	Kirkwood ⁸				39.0 ^a
Woodland ⁸⁸	81	38	58.1	0.85	Millford	71	22	44.7	2.12
Yerba Buena L. H.				1.12	Millboro	71	20	42.4	2.35
Yreka f.	68	21	44.7	0.57	Newark	69	19	40.1	2.69
Yuba City ⁸⁸	66	38	52.6	0.86	Seaford f.	69	20	42.8	2.35
Colorado.					Wilmington f.	70	23	43.8	2.90
Abbot ⁸				0.10	Wilmington f.				1.23
Alma f.	53	-1	32.3	0.30	Dist'ng Reserv'r ⁸⁸	63	21	43.2	1.65
Antlers f.	65	9	38.3	0.11	Rec'ng Reserv'r ⁸⁸	65	20	43.4	1.65
Avoca				0.32	West Washington.	74	21	45.2	1.68
Box Elder				0.17	Florida.				
Breckenridge f.	60	-9	29.6	2.50	Amelia f.	77	35	58.6	4.32
Byers ⁸¹	75	24	39.1	0.00	Archer	85	39	62.5	5.49
Canyon f.	77	13	46.2	0.00	Avon Park f.	87	42	68.0	1.79
Climax ⁸¹	51	-2	26.7	1.00	Brooksville f.	82	36	63.6	1.84
Collbran				0.65	Clermont f.	87	41	66.2	1.67
Colorado Springs f.	71	11	41.6	0.27	De Land f.	84	33	63.2	
Cope f.	77	6	43.4	0.30	Eustis f.	86	34	65.4	2.66
Craig				0.20	Federal Point f.	80	35	62.0	7.61
Crook				0.05	Fort Meade f.	84	33	65.8	1.18
Deer Trail ⁸⁸	73	15	46.5		Gainesville f.	83	33	63.4	5.24
Delta f.	62	11	37.4	0.00	Grasmere f.	85	36	65.4	1.35
Divide Ex. Station.	71	-9	39.5	0.18	Green Cove Sp'gs f.	79	32	58.3	6.75
Downing ⁸⁸	80	10	43.2	0.25	Homeland f.	85	35	64.0	2.18
Dumont	66	0	42.0	0.20	Hypoluxo ⁸¹	86	54	73.4	1.98
Durango f.	64	16	42.1	0.00	Kissimmee f.	87	38	68.7	0.82
First View ⁸⁸	74	12	42.9		Lake City f.	80	31	61.8	3.86
Fleming				0.17	Manatee f.	86	33	65.8	0.58
Fort Collins f.	78	-1	40.5	0.14	Merritts Island f.	84	46	68.5	5.46
Garnett				0.00	Moseley Hall f.	79	32	59.5	3.44
Glen Eyrie f.	68	10	42.3	0.07	Mullet Key f.	79	44	67.0	1.80
Gold Hill ⁸⁸	62	24	42.7	0.45	Myers f.	85	44	68.8	0.97
Grand Junction f.	64	19	42.1	0.16	New Smyrna f.	82	39	61.4	4.09
Greely				0.05	Oak Hill ⁸¹	84	43	69.5	
Holly f.				T.	Ocala ⁸¹	84	40	67.2	3.72
Holyoke				0.40	Orange City f.	86	34	65.0	2.93
Hugo ⁸⁸	70	10	40.4		Orange Park	82	32	60.0	4.35
Hugo (near) f.	72	8	38.7	0.02	Orlando f.	86	39	67.2	3.24
Husted f.	78	5	43.0	0.15	Plant City f.	88	36	67.2	0.97
Julesburg f.	82	3	37.4	T.	St. Francis B'ks	80	36	62.2	7.10
Kit Carson ⁸¹	74	20	40.2		Tallahassee	76	30	57.7	0.90
La Jara f.	67	8	40.4	0.00	Tarpon Springs f.	84	38	64.6	1.93
Lake Moraine	58	-3	34.4	0.30	Georgia.				
Las Animas f.	78	0	44.8	T.	Adairsville f.	70	19	46.7	1.20
Lavender f.	62	15	39.2	T.	Alapaha f.	70	27	46.4	0.99
Lay ⁸¹	63	3	33.6	T.	Albany f.	80	23	55.6	4.80
Le Roy ⁸¹	77 ^d	1	39.5 ^d	0.26	Americus f.	78	22	54.4	1.80
Leslie				0.20	Athens a.	71	20	48.2	1.61
Loveland				0.25	Athens b.	73	17	49.6	1.56
Meeker f.	64	6	37.0	0.14	Bainbridge a.	82	28	56.6	0.61
Minneapolis f.	85	8	45.8	T.	Bainbridge b.				0.61
Monte Vista	64	4	35.7	T.	Blakely ⁸¹	80	27	56.1	1.04
Moraine f.	59	-9	38.0	0.54	Camak f.	69	22	59.7	2.48
Ouray f.	60			1.12	Canton f.	71	14	43.5	0.66
Pugoda (near) f.	69	-8	35.4	0.25	Clayton f.	71	14	43.5	0.66
Rangely	60	6	33.3	0.10	Columbus f.	80	23	55.8	0.52
Red Cliff	60			0.75	Cordoba f.	75	24	52.4	0.30
Rice				0.30	Covington	74	18	50.4	0.41
Rocky Ford f.	79	-7	47.1	0.04	Dahlonega f.	72	17	47.2	1.01
Ruby f.				2.24	Darien f.	80	34	61.2	2.95
Saguache f.	60	4	33.8	0.00	Diamond f.				1.44
St. Cloud				0.20	Dublin a.				2.16
San Juan f.	62	-1	31.4	0.10	Dublin b.				2.40
San Luis f.	67	6	37.0	0.00	Eastman f.	82	23	56.4	1.11
Santa Clara				0.10	Elberton f.	75	23	49.8	1.25
Scissors				0.20	Forayth ⁸¹	78	26	54.8	0.20
Seibert f.				0.10	Fort Gaines f.	84	24	58.2	2.61
Smoky Hill Mine f.	78	0	44.0	0.35	Gainesville f.	69	18	48.2	1.17
Springfield f.				0.35	Gillville ⁸¹	77	25	52.4	1.35
Spring Gulch f.				0.60	Griffin f.	67	20	47.4	1.24
Stamford ⁸¹	66	6	36.0	0.65	Hawkinsville f.	79	21	51.8	2.69
Sunnyside	64	0	34.8	0.52	Lafayette f.	70	16	44.8	0.40
Surface Creek f.	60	16	40.6	0.30	Lagrange f.	75	20	50.6	0.42
Thon f.	77	-2	42.8	0.12	Louisville f.	75	22	51.8	1.29
T. S. Ranch f.	65 ^d	18 ^d	41.2 ^d	0.15	Macon b.				1.19
Twin Lakes				0.34	Marietta f.	71	18	47.9	0.77
					Marshallville f.	82	22	55.7	1.21

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip. in.	Stations.	Temperature. (Fahrenheit.)			Precip. in.
	Max.	Min.	Mean			Max.	Min.	Mean	
Georgia—Cont'd.					Indiana—Cont'd.				
Millen ⁸⁰	80	22	54.0	1.85	Butlerville ⁶⁹	69	0	39.3	1.24
Monticello ⁸¹	78	24	54.0	1.20	Cambridge City ⁶⁵	65	15	39.0	1.90
Morgan ⁷⁷	77	26	54.6	2.50	Columbia City ⁶¹	61	17	35.1	2.73
Newnan ⁷²	72	19	50.8	0.40	Columbus ⁶⁸	68	16	39.8	0.85
Piscola ⁸¹	81	30	58.4	2.45	Connersville ⁶⁸	68	16	37.7	1.44
Point Peter ⁸¹	64	20	48.5	1.40	Crawfordsville ⁶¹	61	18	38.9	2.66
Poulan ⁸⁰	80	21	54.8	0.98	Degonia Springs ⁷¹	71	18	42.6	0.65
Quitman ⁷⁹	79	29	57.0	4.10	Delphi ⁶⁵	65	16	39.6	2.49
Ramsey ⁷⁵	75	16	49.2	0.69	Edwardsville ⁶⁹	69	21	43.1	0.63
Resaca ⁷⁵	75	16	49.2	0.76	Evansville ⁷⁰	70	15	41.8	0.27
Reynolds ⁷¹	71	20	47.2	1.51	Farmland ⁶⁶	66	19	38.1	3.09
Romet ⁷¹	71	20	47.2	1.24	Franklin ⁶⁷	67	18	38.2	1.95
Talbott ⁷⁵	75	20	51.0	1.36	Hammond ⁶¹	61	11	35.5	2.17
Thomasville ⁸⁰	80	28	57.0	0.92	Huntington ⁶⁵	65	18	35.5	3.64
Toocoa ⁷¹	71	17	49.0	1.79	Jasper ⁷¹	71	15	41.7	0.53
Union Point ⁷⁴	74	22	51.8	1.48	Jeffersonville ⁷¹	71	19	42.4	0.60
Washington ⁷³	73	23	51.6	2.36	Kokomo ⁶⁵	65	18	37.4	2.71
Way Cross ⁷⁸	78	30	57.8	3.35	Laconia ⁷⁰	70	19	41.4	0.65
Waynesboro ⁷⁴	74	25	51.6	2.30	Lafayette ⁶⁵	65	15	37.1	2.68
West Point ⁷⁰	70	20	52.4	0.42	Logansport a. ⁶⁵	65	18	37.6	3.16
Whiteburg ⁷⁰	70	20	52.4	0.57	Logansport b. ⁷²	72	17	43.0	0.90
Idaho.					Madison ⁶⁷	67	18	40.3	2.75
American Falls ⁶²	62	3	40.0	0.00	Marion ⁶⁵	65	18	38.1	1.77
Atlanta ⁶⁶	66	38	38.8	1.41	Mauzy ⁶⁶	66	15	36.7	1.54
Boise Barracks ⁶⁴	64	15	43.2	0.35	Mount Vernon ⁷⁰	70	10	41.2	2.98
Chesterfield ⁶⁵	65	1	33.2	T.	Plymouth ⁶⁵	65	8	36.3	0.45
Corral ⁶²	62	21	42.4	2.58	Princeton ⁷²	72	18	41.3	2.70
Fort Sherman ⁶¹	61	18	41.0	3.45	Rockville ⁶⁵	65	14	37.9	2.52
Garden Valley ⁵⁷	57	10	35.2	0.27	Rushville ⁶⁹	69	15	39.8	1.90
Grangeville ⁶²	62	16	43.2	1.25	Scottsburg ⁶⁹	69	18	40.0	1.90
Hailey ⁷¹	71	5	41.6	0.01	Seymour ⁶⁰	60	12	35.4	2.60
Idaho City ⁶⁵	65	9	40.4	T.	South Bend ⁶⁷	67	19	42.0	1.30
Kootenai ⁵⁴	54	20	36.5	2.52	Terre Haute ⁶⁰	60	15	35.8	2.93
Lake ⁵²	52	2	33.0	0.20	Valparaiso ⁷⁵	75	18	41.0	0.87
Lewiston ⁰⁴	04	20	40.2	0.74	Vincennes ⁷¹	71	14	39.6	2.27
Lost River ⁶⁵	65	5	36.6	0.00	Worthington ⁶⁷	67	19	40.0	1.03
Lucas ⁵⁷	57	20	41.2	2.21	Indian Territory.				
Martin ⁵⁷	57	20	41.2	2.21	Beaufault ⁸³	83	12	55.0	0.50
Moscow ⁵⁷	57	20	41.2	2.21	Headout ⁸¹	81	23	54.6	1.44
Murray ⁶⁸	68	11	41.8	0.06	Kempt ⁸⁰	80	13	52.2	0.65
Nampa ⁶⁷	67	13	42.1	0.09	Lehigh ⁸⁷	87	13	52.8	0.00
Oakley ⁶⁸	68	4	40.5	0.27	Pulcell ⁸⁷	87	13	52.8	0.00
Paris ⁶⁸	68	10	43.8	0.36	Tulsa ⁸⁷	87	13	52.8	0.60
Payette ⁶⁹	69	10	41.3	0.19	Iowa.				
Salubria ⁶²	62	2	37.4	0.15	Afton ⁶⁵	65	1	35.2	0.58
Illinois.					Algon ⁶²	62	2	29.6	0.17
Albion ⁷¹	71	14	40.9	T.	Alta ⁶²	62	—	30.1	0.26
Aurora ⁶²	62	9	33.2	1.93	Amana ⁶²	62	3	31.1	1.64
Beardstown ⁶⁹	69	9	34.0	2.52	Ames b. ⁵⁸	58	0	31.2	0.45
Bloomington ⁶⁹	69	9	34.0	2.52	Ames c. ⁵⁸	58	0	31.2	0.45
Braidwood ⁶⁶	66	15	39.0	1.68	Atlantic ⁶⁵	65	4	32.2	0.20
Bushnell ⁷²	72	9	36.6	2.12	Atlantic (near) ⁶²	62	0	34.0	0.31
Carlinville ⁷¹	71	14	38.4	3.46	Audubon ⁶³	63	2	33.8	0.00
Carlyle ⁷¹	71	14	38.4	3.46	Belle Plaine ⁶²	62	2	32.3	1.17
Carrollton ⁷¹	71	0	39.6	1.38	Bonaparte ⁶⁸	68	4	35.1	1.80
Chemung ⁵⁹	59	4	32.8	2.27	Carroll ⁶²	62	0	31.7	0.29
Chester ⁵⁹	59	4	32.8	2.27	Cedar Falls ⁶⁵	65	—	31.1	0.96
Decatur ⁷¹	71	10	38.4	1.77	Cedar Rapids ⁶⁰	60	7	34.0	1.53
Dixon ⁶⁴	64	9	32.4	1.42	Charles City ⁵⁰	50	—	28.8	1.02
East Peoria ⁶⁷	67	11	37.0	2.26	Clairinda ⁶⁶	66	8	34.7	0.55
Effingham ⁶⁶	66	11	37.0	2.26	Clinton ⁶⁵	65	8	33.2	1.62
Evansville ⁶⁰	60	10	34.8	1.45	College Springs ⁷⁰	70	6	36.6	0.45
Fort Sheridan ⁵⁶	56	8	33.5	1.64	Corning ⁶⁶	66	5	35.6	0.85
Galva ⁶⁶	66	7	33.4	1.62	Cresco ⁵⁷	57	—	27.5	0.90
Goldconda ⁷⁴	74	17	45.8	1.39	Decoraht ⁵⁷	57	1	30.0	0.98
Grafton ⁷³	73	12	40.4	1.80	Delaware ⁵⁹	59	3	29.2	1.73
Greenville ⁷⁵	75	11	39.3	1.47	Elkader ⁶⁰	60	3	29.9	1.53
Griggsville ⁷⁰	70	21	43.7	1.17	Emmettsburg ⁶⁶	66	—	29.0	0.43
Halliday ⁷¹	71	12	39.5	1.98	Fairfield ⁶⁴	64	4	33.8	1.66
Havana ⁶⁸	68	24	45.2	0.90	Forest City ⁶¹	61	—	26.0	T.
Herrins Prairie ⁶⁸	68	24	45.2	0.90	Fort Madison ⁶⁴	64	11	37.6	1.18
Jordans Grove ⁷⁰	70	16	42.4	0.77	Galva ⁶⁸	68	0	32.0	0.21
Kankakee ⁶¹	61	14	35.8	2.20	Greenwood ⁶⁶	66	6	35.0	0.01
Lagrange ⁵⁹	59	12	35.0	1.45	Grand Meadow ⁵⁰	50	3	29.9	1.32
Louisville ⁷¹	71	17	40.4	0.68	Greenfield ⁶⁵	65	2	34.5	0.53
Martinville ⁶⁷	67	15	39.2	0.98	Grinnell ⁵⁸	58	4	33.0	1.15
Mascoutah ⁷⁰	70	17	42.4	0.40	Grundy Center ⁶⁴	64	—	31.0	0.47
Mattoon ⁶³	63	23	40.9	3.24	Hampton ⁶³	63	—	29.1	0.41
Monmouth ⁶⁹	69	7	35.4	1.52	Hawkeye ⁶⁶	66	4	34.5	1.19
Mount Carmel ⁶⁷	67	12	38.4	1.50	Hopkinton ⁵⁸	58	5	32.0	1.65
Mount Pulaski ⁶⁹	69	17	41.6	0.47	Humboldt ⁶¹	61	—	31.6	0.23
Onea ⁶⁹	69	15	34.2	1.07	Independence ⁶¹	61	0	31.6	1.11
Onea ⁶⁹	69	15	34.2	1.07	Indianola ⁶³	63	0	33.2	0.83
Pawago ⁶²	62	7	31.9	1.79	Iowa City ⁶⁴	64	3	34.0	1.80
Pottaw ⁵⁶	56	11	33.9	2.09	Iowa Falls ⁶⁴	64	—	28.9	0.25
Quincy ⁷⁰	70	20	41.6	1.05	Keosauqua ⁶⁹	69	9	37.2	1.41
Rialta ⁶⁶	66	14	38.2	3.45	Knoxville ⁶³	63	3	34.5	0.96
Scio ⁶⁸	68	12	37.2	2.92	Larrabee ⁶⁴	64	—	39.4	0.37
Shilo ⁶⁵	65	11	36.2	2.13	Le Claire ⁶²	62	—	32.3	0.00
Stanton ⁶⁵	65	11	36.2	2.13	Mason City ⁵⁹	59	—	27.6	0.33
Union ⁵⁵	55	6	31.0	2.06	Mechanicsville ⁶²	62	4	30.9	0.18
Unionville ⁵⁶	56	10	32.5	2.92	Monticello ⁵⁵	55	2	30.5	2.03
John ⁶⁶	66	14	37.5	1.59	Moor ⁷⁰	70	8	39.2	1.70
Macomb ⁵⁴	54	10	34.3	1.96	Mount Vernon ⁶³	63	2	32.3	0.82
Macomb ⁵⁴	54	10	34.3	1.96	Newton ⁶⁰	60	1	33.2	1.11
Macomb ⁵⁴	54	10	34.3	1.96	North McGregor ⁶⁹	69	—	31.1	0.26
Macomb ⁵⁴	54	10	34.3	1.96	Ogden ⁶⁴	64	0	26.7	0.70
Macomb ⁵⁴	54	10	34.3	1.96	Ogden ⁶⁴	64	3	33.9	1.28
Macomb ⁵⁴	54	10	34.3	1.96	Oskaloosa ⁶⁶	66	3	34.2	1.41
Macomb ⁵⁴	54	10	34.3	1.96	Ottumwa ⁶⁸	68	5	35.2	1.65
Macomb ⁵⁴	54	10	34.3	1.96					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Iowa—Cont'd.					Kentucky—Cont'd.				
Ovid †.....	68	4	34.8	1.70	Harrodsburg †.....	75	8	41.6	1.54
Panama †.....	63	5	33.0	0.26	Hendersont.....	76	19	44.9	2.01
Richland *1.....	65	6	33.9	1.58	Louisa †.....	.....	.....	.....	0.67
Rock Rapids.....	60	-2	31.3	T.	Marlowbone †.....	72	.....	.....	2.36
Rockwell City.....	65	-1	30.1	0.11	Matlock.....	76	10	43.3	2.52
Sac City †.....	49	3	30.7	0.20	Mount Sterling †.....	79	13	39.2	1.67
Seymour †.....	68	5	35.5	2.42	Munfordville *1.....	71	13	47.9	0.72
Sibley.....	59	-3	30.4	0.29	Paducah a.....	.....	.....	.....	0.98
Spirit Lake †.....	62	-4	29.4	0.25	Paducah b †.....	77	16	45.6	0.86
Villisca †.....	65	6	34.2	0.51	Pellville.....	75	13	45.0	1.25
Vinton *1.....	64	3	31.5	0.90	Pleasant R'dge P'rk	71	16	40.3	0.67
Washington †.....	67	8	33.0	1.45	Princeton.....	72	12	42.3	0.17
Wauke.....	64	3	36.0	1.16	Richmond.....	67	11	43.6	0.15
Webster City *1.....	54	3	30.0	0.75	Russellville †.....	80	11	45.2	1.42
Williams *1.....	65	0	29.3	0.28	Sandy Hook.....	78	12	44.1	2.04
Wilton Junction †.....	59	5	32.8	1.29	Shelby City *1.....	72	14	42.0	1.71
Winterset †.....	65	1	33.4	0.50	Shelbyville †.....	73	14	41.1	0.84
Kansas.					South Fork †2.....	.....	.....	39.4	3.06
Abilene †.....	79	8	43.0	T.	Springfield †.....	80	12	44.4	0.88
Achilles *2.....	81	7	32.1	0.02	Williamsburg †.....	.....	.....	.....	2.24
Allison *1 †2.....	80	7	36.0	0.02	Louisiana.				
Atchison †.....	75	12	40.4	0.80	Abbeville.....	83	30	61.0	1.35
Beloit †.....	77	9	44.2	0.17	Alexandria †.....	81	25	55.4	2.38
Blaine *1.....	70	12	39.2	0.50	Amite †.....	84	24	57.6	1.33
Burlington †.....	80	7	40.8	1.00	Bastrop †.....	80	27	53.1	0.75
Coffeyville *1.....	80	10	52.8	1.85	Baton Rouge †.....	84	30	59.6	2.48
Colby †.....	78	2	41.8	0.06	Calhoun †.....	78	29	53.4	1.32
Coldwater †.....	79	8	43.8	T.	Cameron †.....	89	38	62.2	2.70
Collyer *2.....	80	18	36.0	T.	Cheneyville †.....	83	23	55.4	1.09
Columbus †.....	73	4	44.4	1.40	Cinclare.....	84	30	57.7	2.06
Coolidge †.....	78	15	43.8	T.	Clinton †.....	78	32	55.9	1.41
Downs.....	.....	.....	.....	0.08	Coushatta a †.....	.....	.....	.....	2.12
Eldorado †.....	75	9	45.4	0.65	Coushatta b †.....	82	26	55.0	2.15
Elk City *1.....	76	12	46.0	1.22	Covington †.....	79	29	56.4	1.72
Emporia.....	76	10	44.4	0.50	Delhi †.....	.....	.....	.....	2.34
Englewood †.....	86	4	43.4	T.	Donaldsonville †.....	84	34	60.3	1.32
Eureka Ranch †.....	81	5	40.0	0.02	Emilie †.....	79	31	57.5	1.17
Fort Riley †.....	77	10	43.7	0.11	Farmerville.....	79	28	52.4	1.97
Garden City.....	80	11	42.6	T.	Franklin †.....	82	29	59.1	1.60
Garfield.....	75	9	45.4	0.04	Grand Coteau.....	79	35	58.8	1.73
Gibson *1.....	78	5	38.0	T.	Houma †.....	85	35	61.6	1.10
Gove *1.....	80	10	39.0	0.05	Jeanerette †.....	83	32	60.0	1.81
Grenola *1.....	76	9	44.2	0.45	Lafayette †.....	83	29	59.6	1.44
Hays City †.....	85	3	40.5	0.10	Lake Charles †.....	80	34	60.1	2.63
Horton †.....	72	12	40.0	0.29	Lake Providence †.....	80	25	52.3	1.11
Hutchinson †.....	90	6	45.9	0.02	Lawrence †.....	80	40	59.4	0.77
Independence †.....	74	12	46.3	0.68	Liberty Hill.....	85	26	54.0	1.71
Ionia †.....	80	5	39.5	T.	Maurepas.....	83	25	56.8	1.67
Jaqua †.....	82	4	43.4	0.44	Melville †.....	84	31	57.1	1.79
Johnson †.....	82	7	45.4	T.	Minden †.....	80	26	55.4	1.00
Kiowa †.....	85	0	46.6	T.	Monroe †.....	77	30	55.0	1.10
Lakin †.....	90	5	49.6	T.	Natchitoches †.....	87	25	53.9	1.72
Lebo †.....	88	6	44.2	0.99	New Iberia.....	80	35	59.0	1.75
Leoti.....	83	12	42.8	T.	Oberlin.....	80	29	57.5	2.00
Macksville †2.....	83	5	49.7	T.	Opelousas †.....	86	29	59.2	2.15
McPherson †.....	83	7	44.5	0.00	Oxford †.....	81	23	54.4	2.15
Manhattan b.....	79	6	42.1	0.10	Paincourtville †.....	84	27	58.4	1.40
Manhattane *1.....	70	4	36.9	T.	Plain Dealing †.....	79	30	54.0	1.23
Minneapolis †.....	76	6	40.7	0.10	Rayne †.....	85	30	60.5	2.45
Morland †.....	83	4	41.5	0.11	Schriever †.....	82	26	58.6	1.47
Morton †.....	84	10	45.2	T.	Shell Beach.....	78	36	60.2	1.30
Mount Hope *1.....	80	15	46.1	T.	So. University *1.....	80	41	58.8	1.62
Ness City †.....	74	22	48.0	0.10	Sugar Ex. Station †.....	81	32	57.8	1.06
New Eng. Ranch †.....	80	1	38.2	0.00	Sugartown †.....	79	23	52.2	1.21
Oberlin †.....	72	10	42.0	2.23	Thibodeaux.....	.....	.....	.....	0.54
Olathe.....	72	10	42.0	2.23	Wallace.....	81	35	58.6	1.50
Oswego †.....	77	1	43.5	1.58	West End.....	.....	.....	.....	0.75
Phillipsburg.....	82	4	40.0	0.00	Maine.				
Pleasant Dale †.....	82	5	42.7	0.17	Bar Harbor.....	58	18	38.5	1.84
Quinter *1.....	75	15	46.6	0.10	Belfast *2.....	56	6	32.5	3.52
Rome *1.....	77	9	45.5	0.38	Calais †.....	60	4	34.2	3.53
Sedan †.....	77	13	47.8	0.70	Cornish *1.....	55	8	30.5	2.05
Sharon Springs *1.....	80	18	46.4	T.	Easton †.....	55	-2	27.0	2.02
Topeka.....	81	11	40.4	0.40	Fairfield.....	59	-4	32.6	2.02
Tribune †.....	78	9	42.1	T.	Farmington †.....	63	-7	28.7	2.27
Ulysses †.....	86	15	44.6	T.	Gardiner.....	58	4	33.0	2.21
Wa Keeney *1.....	82	20	47.0	T.	Houlton †.....	55	0	28.3	3.18
Wakefield *1.....	88	11	42.4	0.24	Lewiston.....	59	4	31.8	2.59
Wallace a.....	74	12	40.7	0.05	Madison *1.....	56	-4	31.6	2.48
Wamego *1.....	74	12	40.7	0.32	Mayfield.....	54	-4	27.3	2.48
Washington †2.....	78	7	40.3	0.10	Orono †.....	59	-5	29.8	1.24
Wellington *1.....	74	12	48.4	0.22	Petit Menan *1.....	54	10	35.9	.....
Westmoreland †2.....	74	12	48.4	0.22	West Jonesport *1.....	54	5	33.4	.....
Winfield *2.....	74	6	43.4	0.49	Maryland.				
Winona *2.....	74	12	38.7	T.	Annapolis.....	69	25	43.8	2.16
Yates Center †.....	76	7	43.2	2.24	Bachmans Val. *1.....	62	19	38.1	2.73
Kentucky.					Bel Alton.....	71	24	45.2	0.90
Alpha *1.....	72	18	50.7	4.78	Boettcherville *1.....	70	16	39.8	0.50
Blandville †.....	76	20	44.8	0.76	Burkittsville.....	66	21	42.2	1.73
Bowling Green a *1.....	71	10	41.1	1.40	Charlotte Hall †.....	70	20	44.0	1.65
Bowling Green b †.....	74	13	44.1	1.41	Cherryfield †2.....	.....	.....	44.8	2.38
Burnside.....	.....	.....	.....	2.32	College Park.....	70	16	42.4	1.60
Canton *1.....	76	18	45.3	0.81	Cumberland a †.....	68	17	38.6	0.63
Carrollton †.....	72	14	39.9	0.36	Cumberland b.....	67	19	42.0	0.71
Cattletsburg * †2.....	60	16	41.6	2.17	Darlington †.....	63	20	41.4	2.69
Earlington.....	77	16	45.8	0.72	Deer Park.....	65	2	33.4	1.13
Eddyville *1.....	71	17	45.6	0.54	Denton †.....	80	25	45.7	2.67
Edmonton †.....	69	14	42.8	2.13	Easton †.....	72	21	45.4	2.77
Eubank †.....	75	10	42.0	2.77	Fallston *1.....	61	21	40.4	2.22
Falmouth †.....	.....	.....	.....	0.72	Frederick a.....	69	22	42.2	1.60
Fords Ferry †.....	78	11	42.7	0.80	Frederick b.....	67	24	43.0	1.48
Franklin *1.....	78	15	46.4	1.91	Grantsville.....	67	15	37.0	2.32
Georgetown.....	69	14	42.2	1.38	Great Falls *2.....	65	19	43.0	1.69
Greendale *1.....	70	13	41.7	1.38	Jewell †.....	70	21	45.1	1.44
Greensburg *1.....	75	14	43.0	1.42	Johns Hopkins Hos	70	22	42.6	.....

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Maryland—Cont'd.					Michigan—Cont'd.				
La Plata†	70	20	42.6	2.00	Berrien Springs a *1	58	20	36.6	3.50
McDonogh	66	21	43.3	2.80	Birmingham	64	14	33.6	0.75
Mardela Springs†	70	21	43.1	2.80	Boon	55	4	27.4	2.51
Mt. St. Marys Col *1	67	22	41.6	2.01	Bronson	68	12	33.7	1.52
Oakland†	66	8	34.9	2.30	Brown City†	52	11	29.1	0.27
Pocomoke City	79	21	48.2	1.20	Calumet	64	1	25.5	3.48
Popes Creek	70	22	44.0	1.20	Charlevoix	58	14	33.1	1.42
Princess Anne	70	21	43.7	2.29	Cheboygan	51	5	29.8	2.26
Sharpsburg	67	20	41.2	1.41	Clinton	65	11	33.6	1.60
Solomons†	70	26	46.8	2.35	Crisps *10	48	10	30.1	1.70
Sunnyside	68	6	33.6	3.34	Fitchburg	63	10	32.6	1.70
Taneytown†	69	17	43.7	2.11	Flint	63	7	31.6	0.85
Upper Marlboro	69	17	43.7	1.63	Frankfort *10	58	19	37.5	1.42
Western Port.	67	15	39.2	2.15	Gladwin	59	10	31.5	1.51
Woodstock	66	18	41.0	1.55	Grand Rapids	64	16	35.9	1.33
Massachusetts.					Grape	66	13	35.4	0.89
Adams	60	12	35.8	.....	Grayling	56	6	29.4	1.50
Amherst	62	9	34.5	3.04	Grindstone City *10	60	15	33.9	.....
Amherst Ex. St'n a.	65	9	33.8	3.09	Hanover	71	15	30.9	1.63
Amherst Ex. St'n b.	65	10	34.8	3.14	Harbor Springs	55	10	31.2	2.22
Andover	61	8	37.9	1.85	Harrison	57	5	28.0	1.23
Ashland	62	11	34.3	3.42	Harrisville	54	5	30.2	2.19
Bedford	62	11	34.3	2.58	Hart	50	10	29.8	2.65
Beverly Farms	61	9	36.2	3.84	Hesperia	58	5	28.6	1.12
Blue Hill (sum't).	63	9	34.8	4.10	Holland *10	62	20	37.3	.....
Blue Hill (valley).	66	10	35.1	4.32	Howell	64	9	32.2	1.18
Boston	67	11	37.5	4.37	Ivan	54	8	30.4	2.35
Brookton a.	67	11	37.5	4.37	Jeddo	62	10	32.2	1.48
Brookton b.	67	11	37.5	4.12	Kalamazoo	63	16	34.5	2.40
Brookton c.	67	11	37.5	3.94	Lake City	63	16	34.5	2.40
Cambridge a.	65	12	36.7	3.49	Lansing	62	14	32.4	1.05
Cambridge b.	65	14	36.1	3.34	Lewistown	53	8	28.4	1.03
Chestnut Hill	65	11	36.6	3.41	Ludington *10	55	15	33.3	.....
Clinton	63	10	34.2	2.50	Madison	63	14	34.0	1.75
Concord	63	10	34.2	3.28	Manistee *10	50	18	33.7	.....
Dudley	55	8	32.8	1.77	Mayville	61	7	32.0	0.89
East Templeton *1	58	10	31.4	3.43	Middle Island *10	52	13	33.4	.....
Egg Rock, Nahant.	61	14	37.6	.....	Mottville	53	9	35.2	1.97
Fall River *1	62	17	38.9	3.41	Muskallonge L. *10	64	6	29.5	.....
Fiskdale	59	12	32.4	3.08	N. Manitowish Ist'd *10	48	13	32.3	.....
Fitchburg a *1	59	12	32.4	3.68	North Marshall	63	8	31.4	1.05
Fitchburg b.	61	8	33.0	3.24	Northport	56	14	33.2	1.98
Framingham	64	8	35.2	3.43	Old Mission	56	11	31.4	2.06
Gilbertville †	55	8	32.3	1.69	Ottawa Point *10	66	11	33.9	.....
Groton	59	8	32.6	3.95	Ovid	62	10	32.6	1.03
Hadley	64	9	32.7	3.78	Paris	51	3	29.6	1.65
Hingham	64	9	32.7	4.50	Parkville	51	3	29.6	1.65
Hyannis	64	13	42.9	3.91	Pentwater *10	56	16	37.7	.....
Lake Cochituate.	67	1	33.1	3.53	Pesci Barques *10	54	10	33.4	.....
Lawrence	60	10	34.9	2.73	Point Betsey *10	58	19	35.9	.....
Leeds	62	10	33.4	3.25	Pontiac	65	12	33.14	.....
Leominster *6	63	13	34.1	3.43	St. Ignace	50	2	29.8	2.00
Long Plain *6	60	10	37.2	5.08	St. Johns	52	11	33.6	1.21
Lowell a.	63	11	34.9	3.52	Sand Beach a.	59	10	33.2	1.38
Lowell b.	63	11	34.6	3.52	Sand Beach b *10	55	18	34.9	.....
Lowell c.	66	10	36.2	.....	Ship Canal *10	48	8	28.4	.....
Ludlow Center	60	4	30.3	4.07	Stanton	60	10	31.9	0.94
Lynn a.	62	12	35.2	3.34	Sturgeon Point *10	53	7	33.4	.....
Lynn b.	60	15	37.4	.....	Thornville	67	13	34.3	1.31
Mansfield *1	60	6	34.2	4.39	Thunder Bay Ist'd *10	52	13	32.8	.....
Middleboro	64	6	36.2	4.22	Two Heart River *10	46	10	29.0	.....
Milton	61	12	37.4	3.68	Vandalia	66	13	36.4	2.40
Monroe	57	6	29.8	3.31	Vermillion Pt. *10	46	2	24.6	.....
Monson	63	8	34.8	4.17	Ypsilanti	65	9	33.6	1.08
Mount Nonotuck.	63	8	34.8	4.17	Minnesota.				
Mystic Lake.	63	8	34.8	4.17	Ada	49	-19	19.2	0.13
Mystic Station.	63	8	34.8	4.17	Alexandria a†	53	-	27.0	0.36
Natick *1.	60	14	34.9	3.89	Beardsley†	56	-9	27.0	0.53
New Bedford a.	62	14	38.6	4.55	Belle Plaine *1	63	-4	27.8	.....
New Bedford b.	63	12	39.4	4.25	Bingham Lake.	48	-3	26.8	0.06
Newburyport	63	10	37.2	1.15	Bird Island	54	-8	26.1	0.34
North Billerica	64	14	36.8	2.41	Blooming Prairie *1	58	-2	25.6	0.58
Pittsfield	58	10	33.2	3.08	Bonniwells Mills†	55	-6	26.6	0.54
Plymouth *1	64	14	40.5	4.98	Cambridge†	48	-6	25.6	0.34
Provincetown.	60	19	40.4	3.17	Camden†	58	-11	28.0	0.49
Randolph	60	19	40.4	3.17	Campbell	53	-11	24.4	0.35
Roberts Dam	60	19	40.4	3.17	Clear Lake†	52	-10	23.8	0.59
Roxbury	64	15	37.7	3.68	Clearwater *1	48	-2	26.2	0.44
Salem	64	15	37.7	3.68	Collegeville.	54	-4	27.1	0.16
Salisbury	64	15	37.7	3.68	Crookston†	44	-15	22.5	0.40
Somerset *1	64	14	39.6	4.70	Dawson	53	-6	26.2	0.39
Springfield Arm'y.	64	14	39.6	4.70	Farmington†	53	-6	26.2	0.95
Sutton b.	65	12	37.0	4.62	Fergus Falls†	53	-7	24.6	0.40
Sutton c.	66	8	36.6	6.21	Fort Ripley†	53	-7	24.6	0.40
Sutton d.	68	10	37.0	4.15	Grand Meadow†	55	-6	25.8	0.55
Wakefield†	63	11	35.6	4.37	Granite Falls	58	-7	26.0	0.09
Waltham	63	11	35.6	4.37	Hutchinson.	48	-6	26.0	0.10
Webster	63	11	35.6	4.37	Jadis†	49	-20	18.2	0.92
Wellesley	65	10	35.4	4.07	L Winnibogishish *1	45	-14	20.8	0.80
Westboro†	63	10	35.5	3.46	Lawrence†	49	0	25.4	0.77
Williamstown	60	10	33.2	.....	Leech Lake *1.	44	-20	22.5	0.52
Winchendon	63	10	33.2	.....	Long Prairie†	52	-11	22.2	0.39
Winchester	63	10	33.2	.....	Luverne†	56	-1	28.6	0.40
Vinthrop	63	13	36.8	2.79	Maple Plain	55	-7	26.4	0.03
Vorcestor a.	69d	10d	35.8d	2.84	Marfield†	52	-20	20.4	1.54
Vorcestor c *1	62	11	34.3	.....	Mazeppa†	48	0	29.2	0.70
Michigan.					Milan†	55	-10	25.4	0.20
Adrian	67	13	34.0	1.99	Minneapolis a†	52	-6	26.9	0.52
Albion	61	15	34.0	1.58	Minneapolis b†	52	-4	27.0	0.53
Allegan	62	14	35.4	2.05	Minnesota City†	54	0	29.6	1.29
Alma	60	8	31.7	0.81	Montevideo†	56	-6	27.0	0.22
Ann Arbor	64	14	33.6	1.76	Morris†	54	-11	25.6	0.28
Arbela *3	62	10	28.6	0.47	New Richland *10	50	-1	27.9	.....
Arlet Mountain	62	9	32.6	1.34	New Ulm	54	0	31.9	0.60
Berlin *1	63	8	31.1	1.38	Ortonville†	54	0	31.9	0.60

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Minnesota—Cont'd.	°	°	°	<i>Ins.</i>	Missouri—Cont'd.	°	°	°	<i>Ins.</i>
Park Rapids f.....	47	-17	30.9	0.70	Humansville.....	74	8	43.4	2.40
Pine River f.....	45	-13	23.3	0.58	Ironton f.....	68	18	41.8	1.30
Pleasant Mounds f.....	63	-3	37.5	0.40	Jefferson City.....	75			1.90
Pokagon Falls f.....	39	-24	18.1	0.92	Kidder.....	66	7	38.2	1.46
Red Wing f.....				0.40	Lamar.....	73	10	45.5	1.38
Redwood Falls f.....				0.12	Lamonte.....				1.73
Rolling Green f.....	57	-3	28.1	0.40	La Plata f.....	66	14	38.3	1.08
St. Charles f.....	52	-1	27.2	0.84	Lebanon.....	79	10	45.1	2.62
St. Cloud.....	50	-6	25.0	0.72	Liberty.....	72	12	41.5	1.43
St. Olaf.....	49	-10	25.9	0.51	Linn Creek.....	79	13	46.0	5.40
St. Peter f.....	50	-2	27.6	0.45	Louisiana Bridge f.....				1.28
Sandy Lake Dam f.....	47	-15	22.3	0.65	McCune f.....	77	11	39.0	2.87
Sauk Center.....	50	-12	22.5	0.50	Marble Hill.....		14		1.71
Sunrise City f.....	46	-4	25.1	0.41	Marceline.....				1.55
Two Harbors f.....	59	-6	27.4	1.19	Marshall f.....	74	8	39.5	1.05
Wabasha f.....	50	-7	28.7	0.85	Maryville f.....	66	4	32.4	0.35
Willmar f.....	54	-8	35.3	0.40	Mexico f.....	76	6	38.4	3.60
Winona.....	52	3	29.4	1.30	Miami.....	72	12	42.0	0.96
Worthington.....	56	-3	27.3	0.11	Mine La Motte f.....	69	18	43.1	0.93
Mississippi.					Mount Vernon.....	70	8	42.3	1.38
Aberdeen f.....	74	13	45.8	1.10	Nevada.....				1.50
Agricultural College.....	75	25	51.4	0.16	New Hartford f.....	73	12	40.5	3.26
Bateville f.....	70	10	50.0	0.66	New Haven f.....	72	17	38.4	1.77
Bay St. Louis f.....	73	33	56.8	0.97	New Madrid.....	75	20	47.9	0.98
Biloxi f.....	70	28	56.2	0.35	New Palestine.....				0.95
Briers.....	78	32	53.6	1.03	Oakfield f.....	73	15	42.4	2.14
Brookhaven f.....	84	24	55.7	1.43	Oak Ridge f.....		20	42.2	0.68
Canton f.....	77	26	53.2	0.46	Olden f.....	74	16	47.4	1.14
Columbus f.....	74	18	50.6	0.44	Oregon f.....	73	10	39.6	0.68
Corinth.....	71	20	47.1	0.69	Oregon f.....	70	11	39.0	0.67
Crystal Springs f.....	79	26	54.6	1.35	Palmyra.....				3.05
Duck Hill f.....	70	21	50.0	0.92	Panacea.....	74	14	49.0	1.89
Edwards.....	76	26	53.4	1.56	Pickering f.....	72	7	36.4	0.20
Egypt f.....	75	30	50.6		Platte River f.....	72	12	35.8	1.06
Enterprise f.....	81	33	52.0	0.76	Poplar Bluff.....	75	15	46.4	0.62
Fayette f.....	76	29	52.0	1.38	Potosi.....	80	8	39.6	1.79
French Camp f.....	70	11		1.04	Princeton f.....	68	6	37.8	1.61
Greenville f.....	75	29	52.0	0.34	St. Charles.....	73	14	41.6	2.53
Greenville f.....	79	26	53.4	0.35	St. Joseph f.....	74	16	41.0	1.42
Hattiesburg f.....	82	23	53.6	0.97	St. Louis.....	74	16	41.0	1.42
Hazlehurst f.....	81	27	55.8	0.70	Sarcoxie f.....	80	8	43.3	1.95
Hernando f.....	75	23	50.8	0.25	Sedalia.....	76	8	41.8	1.29
Holly Springs f.....	74	22	49.8	0.96	Shelbina.....				1.70
Jackson f.....	79	30	53.7	2.81	Steffenville.....				0.88
Kosciusko f.....	77	20	52.0		Stellada f.....	77	11	44.1	1.31
Lake f.....	81	20	50.1	2.49	Sublett.....	68	5	36.4	2.05
Leakeville f.....	85	23	59.0	0.14	Tindall f.....				1.67
Logtown f.....	77	28	56.7	1.20	Unionville f.....	77	3	32.6	1.83
Louisville f.....	83	14	51.6	0.68	Vera Cruz.....				1.39
Macon f.....	77	22	51.6	0.63	Vermont f.....	73	10	40.2	1.01
Moss Point f.....	77	30	56.6	0.35	Vilas.....				1.33
Natchez f.....	80	32	55.1	1.80	Virgil City.....				2.06
Okolona f.....	76	20	49.6	0.82	Warrensburg f.....	73	16	42.9	0.89
Palo Alto f.....	78	32	51.8	1.32	Warrenton.....	73	12	43.4	2.91
Pontotoc f.....	77	24	50.7	1.29	Wheatland.....				3.47
Port Gibson f.....	82	22	53.9	1.67	Montana.				
Rosedale f.....	87	17	51.6	0.22	Anaconda f.....				0.87
Stonington f.....	88	30	56.6		Billings f.....	70	9	36.0	1.05
Thornton f.....	80	32	53.1	0.60	Boulder f.....	71	-6	38.8	0.14
Topton f.....	78	30	50.8	0.47	Hosmer f.....	65	5	39.2	0.00
University.....	78	25	50.8	0.34	Butte f.....	66	3	38.8	0.14
Vaiden f.....	84	16	52.4	0.40	Cascade f.....				0.44
Water Valley f.....	78	24	49.4	0.40	Cokedale f.....	68	3	36.7	0.30
Waynesboro f.....	75	20	50.8	1.40	Columbia Falls f.....	54	15	37.3	1.32
Waynesboro f.....	81	18	54.5	1.04	Fort Custer f.....				1.45
Williamsburg f.....	79	25	55.4	0.46	Fort Keogh.....	67	0	34.1	0.72
Woodville f.....	80	30	58.0	1.69	Fort Missoula.....	68	11	37.8	1.16
Yazoo City f.....	83	20	53.4	0.98	Glasgow f.....	63	-1	29.0	0.15
Missouri.					Glendive f.....	60	-1	31.6	0.48
Appleton City f.....	75	9	43.6	2.17	Great Falls f.....	70	4	40.6	0.14
Arthur f.....		6	38.2	1.65	Hogan f.....	66	-4	37.8	0.09
Bagnell f.....				2.49	Kipp f.....	70	-10	37.4	0.55
Bethany.....	70	11	39.0	1.00	Martinsdale f.....	64	-6	37.4	0.55
Birch Tree.....	73	17	44.5	1.00	Marysville f.....	65	5	38.9	0.67
Bluffton f.....	75	12	42.7	1.92	Mingsville f.....	69	-6	36.0	0.45
Boonville f.....				1.71	Utica f.....	73	-6	36.6	0.48
Brunswick.....	71	9	40.0	1.55	Virginia City f.....	62	6	40.0	T.
Carrollton f.....	70	13	42.4	1.54	Nebraska.				
Conception.....				2.20	Agee f.....	62	6	31.7	0.17
Cowgill f.....	70	12	41.2	1.42	Alliance.....				0.30
Darksville f.....	64	10	40.6	1.13	Ansley f.....	73	11	38.6	T.
Downing.....				2.22	Arapahoe.....				0.00
East Lynne f.....		7	38.4	1.55	Arberville f.....	66	10	32.6	0.11
Edge Hill f.....	70	16	43.4	1.60	Arcadia.....				0.00
Eight Mile f.....	72	8	41.4	1.45	Ashland f.....	66	8	36.4	0.25
Eldon f.....	76	16	43.4	1.80	Auburn f.....	73	10	37.1	0.19
Elmira.....	71	14	39.3	1.19	Aurora f.....	65	10	33.8	T.
Emma f.....				0.25	Bassett.....	75	4	35.8	0.25
Fairport.....				1.46	Beatrice f.....	72	10	36.7	0.00
Farmersville.....				0.25	Beaver City.....	81	9	41.6	0.00
Fayette.....	77	10	41.0	2.07	Benkelman f.....	85	10	38.8	0.05
Fox Creek f.....	73	5	41.9	2.04	Blue Hill f.....	74	10	39.4	0.20
Fulton.....				2.12	Bratton f.....	71	12	37.2	0.20
Gallatin f.....	68	9	37.6	1.66	Broken Bow f.....	70	10	39.6	0.00
Gayoso f.....				0.54	Burchard f.....	70	10	37.3	0.00
Glasgow.....	75	8	40.3	1.12	Burwell f.....	60	12	35.8	0.00
Glensted.....				1.22	Callaway f.....	35	8	32.5	0.00
Gordonville f.....				1.90	Central City f.....	64	12	37.2	0.17
Grove f.....				2.23	Chadron f.....	86	1	38.0	0.26
Grove Dale.....	76	3	42.0	1.84	Chester f.....	78	9	35.9	T.
Half Way.....	73	10	43.6	2.16	Columbia f.....	68	8	37.3	0.15
Harrisonville f.....	74	8	39.7	1.16	Cornelia.....				0.13
Hermann f.....				2.03	Cortland f.....	68	8	34.2	T.
Houston f.....	70	11	43.4	1.70	Creighton f.....	69	4	31.8	0.12
Houstonia (near).....				1.30	Crete.....	73	8	39.4	T.

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Nebraska—Cont'd.					Nevada—Cont'd.				
Culbertson.....	o	o	o	Ins.	Gold Hill.....	83	19	53.6	0.07
Curtis f.....	74	7	43.5	T.	Halleck.....	65	-12	29.8	0.00
David City f.....	72	0	34.1	T.	Hawthorne f.....	63	24	46.4	0.00
Dunning.....	64	10	31.9	T.	Hawthorne f.....	69	15	45.4	0.00
Edgar f.....	60	12	41.4	T.	Hot Springs f.....	72	10	49.6	0.00
Elwood.....	68	12	36.5	0.00	Humboldt f.....	72	7	41.6	0.00
Erie f.....	70	12	34.9	0.00	Levers Ranch.....	73	19	48.7	0.36
Fairmont f.....	75	9	36.8	0.07	Lovelock f.....	81	18	46.7	0.00
Fontanelle.....	64	6	34.8	0.13	Marlette Lake.....				0.60
Fort Robinson.....	79	0	39.4	0.39	Mill City f.....	75	10	42.0	0.00
Franklin f.....	79	8	37.5	0.07	Osceola.....	76	13	47.6	0.00
Geneva f.....	79	8	36.9	0.07	Palisade f.....	76	6	42.5	0.00
Genoa f.....	68	8	35.0	0.10	Palmetto.....	72	12	44.5	0.00
Gering f.....	78	4	42.4	0.49	Paradise Valley.....	78	-2	42.7	0.00
Glenwood f.....	70	8	29.6	0.06	Reno f.....	72	18	47.8	0.00
Gothenburg.....	70	15	42.0	0.00	Reno State Univ'ty.....		15		0.02
Grand Island f.....	64	20	33.7	0.00	Ruby Valley f.....				0.18
Greely Center f.....	70	10	33.6	0.00	St. Clair.....	68	14	43.0	0.00
Haigler f.....	84	8	40.1	0.10	Stofel.....	68	-5	36.0	0.15
Hartington f.....	65	3	34.8	0.05	Sunnyside.....	76	30	51.2	0.00
Hastings f.....	66	10	36.9	0.18	Tecoma f.....	72	12	38.7	0.00
Harvard f.....	73	10	36.1	0.16	Toano f.....	65	-2	35.2	0.00
Hay Springs f.....	70	1	36.5	0.75	Tybo.....	62	15	43.6	0.00
Hebron f.....	75	5	38.9	T.	Verdi f.....	70	15	43.7	0.10
Hickman f.....	70	12	36.9	0.04	Virginia City.....		14		0.01
Holdrege f.....		13	33.4	T.	Wadsworth f.....	73	17	40.1	0.00
Holdrege b f.....	73	10	39.3	0.00	Winnemucca f.....	70	8	40.5	0.00
Imperial f.....	78	11	39.8	0.05	Yerington.....	70	11	44.0	T.
Imperial b f.....	80	8	40.7	T.	New Hampshire.				
Indianola f.....	75	10	44.3	T.	Alstead f.....	56	4	30.7	2.25
Keaneey f.....	66	16	38.0	0.00	Belmont.....				1.85
Kenney f.....	68	11	36.3	0.58	Berlin Mills.....	58	-7	29.4	2.25
Lexington f.....	78	9	37.0	0.20	Bethlehem.....	54	0	27.9	1.77
Lodge Pole f.....	74	5	39.6	0.05	Brookline f.....	61	10	32.7	3.35
Loup City f.....	71	13	39.0	0.06	Concord.....	61	9	33.3	1.73
Lynch f.....	72	10	33.2	0.12	Dublin.....	57	5	30.3	3.85
McCook f.....	71	12	38.8	T.	Grafton.....	59	-1	29.0	2.05
Madison.....				0.17	Hanover.....	59	8	31.9	2.46
Madrid f.....	75	5	39.3	0.05	Keene.....	63	4	32.0	2.04
Marquette f.....	67	11	36.5	0.21	Lakeport.....				1.95
Minden f.....	70	8	40.2	0.05	Lancaster.....	62	2	32.0	1.84
Mullen f.....	70	8	40.2	0.00	Littleton.....	57	1	29.5	2.02
Nebraska City f.....	62	9	34.2	0.00	Mine Falls.....				2.69
Neisbit f.....	62	9	41.7	T.	Nashua.....	62	10	33.4	3.03
Norfolk f.....	62	6	34.3	T.	Newton.....	57	6	32.0	2.83
North Loup f.....	71	13	37.3	0.05	North Conway.....	63	1	29.4	2.20
Oakdale f.....	68	4	33.4	0.10	Pennichuck Station.....				2.94
Oak Hall f.....	72	12	38.3	0.12	Peterboro.....	59	1	30.4	2.59
Ogallala f.....	82			T.	Plymouth.....	58	3	27.7	2.27
O'Neill f.....	71	10	33.7	0.26	Sanborn f.....	59	1	30.0	1.27
Ough.....				0.05	Stratford.....	51	-5	28.7	1.96
Palmer f.....	68	8	34.4	T.	Weirs Bridge.....				1.52
Plattsmouth f.....				0.15	West Milan.....	57	-8	28.6	3.44
Plattsmouth b f.....	65	12	36.6	0.07	Wolfboro.....				1.16
Ravenna.....	75	12	36.8	0.12	New Jersey.				
Red Cloud a.....				0.05	Allaire.....	68	13	39.7	.....
Red Cloud b f.....	65	14	40.5	0.03	Asbury Park.....	62	19	40.3	2.72
Republican f.....	62	11	38.7	0.00	Barnegat.....	67	10	42.0	3.25
Rulo f.....	73	12	39.2	0.50	Bayonne.....	64	18	40.4	3.60
Salem f.....	68	18	44.9	2.00	Beach Haven.....	65	24	43.0	3.18
Sanjee Agency f.....	69	4	32.1	0.12	Beldvidere.....	72	14	38.2	3.32
Seneca f.....	65	10	37.6	0.00	Beverly f.....	76	17	41.4	3.55
Seward f.....	67	9	31.8	0.00	Billingsport f.....	64	20	40.1	2.98
Schuyler.....				0.10	Blairstown.....	65	17	38.2	2.51
Springview.....	74	5	35.8	0.39	Bridgeton.....	68	25	43.8	3.24
Stanton f.....	64	7	44.1	0.07	Camden.....	69	30	40.4	3.38
State Farm.....	74	11	38.5	0.12	Cape May.....	66	24	45.6	1.77
Strang f.....	68	10	40.0	0.00	Cape May C.H. f.....	66	21	44.2	2.15
Superior f.....	80	12	43.3	0.00	Charlotteburg.....	66	11	37.0	3.40
Tilton.....	73	7	35.1	0.00	Chester.....	62	13	35.6	3.52
Tynghouse.....				0.13	Deckertown f.....	66	12	35.4	3.49
Tecumseh f.....	72	8	37.4	0.11	Dover.....	70	12	37.4	3.09
Tekamah.....	65	3	33.0	T.	Egg Harbor City.....	69	16	40.2	2.90
Turlington f.....	71	7	36.8	0.22	Elizabeth f.....	63	17	39.6	4.08
Wakfield.....				0.08	Franklin Furnace.....	65	13	37.0	3.16
Wallace f.....	78	12	37.0	T.	Franklinville.....	68	13	39.8	3.40
Weeping Water f.....	65	4	34.0	0.03	Freehold.....	69	16	40.4	4.08
West Point.....	67	6	35.7	0.30	Friesburg.....				2.99
Whitman.....	72	12	38.6	T.	Gillette.....	68	15	37.8	3.58
Wilcox.....				0.02	Hammonont.....				2.05
Wilsonville f.....	75	10	41.1	T.	Hanover.....	63	16	39.0	3.47
York f.....	66	2	37.8	0.15	Hightstown.....	69	19	39.8	4.07
Nevada.					Imlaystown.....	68	19	41.1	3.82
Austin.....	64	10	42.0	T.	Junction.....				2.66
Battle Mountain f.....	67	10	41.7	0.00	Lambertville.....	54	19	38.0	2.50
Bellville f.....	74	24	44.2	0.00	Millville.....	72	18	43.2	2.43
Belmont.....	68	14	45.4	0.00	Moorestown.....	72	18	40.9	3.86
Beowawe f.....	70	6	40.0	0.00	Newark f.....	64	21	40.2	3.68
Carlin f.....	76	-8	34.9	T.	New Brunswick a.....	72	17	39.7	3.55
Carson City.....	76	11	43.6	0.22	New Brunswick b.....	68	19	39.6	3.57
Clear Valley f.....				0.00	Newton.....	66	12	36.6	3.09
Cortez f.....				T.	Ocean City.....	63	23	43.9	2.35
Cranes Ranch.....				0.05	Oceanic.....	69	25	43.3	3.83
Downeyville.....	79	17	47.4	T.	Patterson.....	70	18	41.1	3.88
Edgewood.....	66	10	41.6	0.60	Pensauken.....				3.31
Elko f.....	70	-2	32.2	0.00	Perth Amboy.....	65	19	39.8	3.96
Elko (near).....	81	-4	40.8	0.00	Plainfield.....	70	17	39.8	3.38
Elly.....	66	4	39.7	0.00	Rancocas f.....	63	19	39.8	3.19
Empire Ranch f.....	63	-6	31.0	0.00	Readington f.....	68	24	45.4	.....
Ennelon f.....	65	10	41.7	0.00	River Vale.....	66	12	38.6	4.93
Enos.....	75	26	50.0	0.45	Somerville.....	70	13	41.2	3.17
Escondido f.....	80	14	42.6	0.00	South Orange.....	65	18	38.5	3.78
					Tenafly.....	67	20	38.8	5.12
					Toms River.....	71	14	40.2	3.53
					Trenton.....	72	18	43.1	3.77

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>New Jersey—Cont'd.</i>					<i>New York—Cont'd.</i>				
Vineland.....	74	18	41.8	2.72	Skaneateles.....	65	13	34.5	1.72
Whiting.....	72	18	42.3	2.92	South Canisteo.....	63	7	32.1	2.30
Woodbine.....	68	17	41.0	3.03	South Kortright f.....	60	9	34.5	1.68
<i>New Mexico.</i>					Stillwater.....	58	3	29.0	3.38
Albert f.....	75	22	49.2	0.00	Turin.....	58	3	33.6	3.82
Albuquerque f.....	68	18	44.2	T.	Varysburg.....	71	0	36.3	3.27
Almat f.....	76	20	48.0	0.00	Wappingers Falls.....	61	14	36.3	2.73
Bloomfield.....	69	10	38.5	0.00	Watertown.....	62	8	33.7	2.30
Chama f.....	79	11	44.7	0.10	Waverly f.....	69	13	35.7	1.95
Ciruela.....				T.	West Chazy.....	58	8	31.7	2.03
Deming.....	79	36	53.0	0.00	West Point f.....	66	19	40.1	5.54
East Las Vegas f.....	69	13	44.0	0.00	Willets Point.....				
Eddy f.....	83	31	53.8	0.00	<i>North Carolina.</i>				
Estalina Springs.....	66	15	42.9	0.00	Asheville f.....	79	16	43.9	0.54
Fort Bayard.....	75	25	51.6	0.00	Auburn.....	80	24	49.8	1.26
Fort Stanton f.....	73	15	45.7	T.	Bailey.....	78	22	48.5	1.60
Fort Wingate.....	75	15	46.0	0.00	Bakersville f.....	74	9	41.0	0.39
Fresnal.....	69	19	41.7	0.00	Blowing Rock f.....	64	12	38.6	1.22
Galisteo f.....	67	20	42.9	0.00	Bryson City f.....				0.26
Galinas Spring f.....	75	8	46.6	0.00	Chapel Hill f.....	75	21	46.8	1.85
Gila.....	76	25	50.8	0.00	Currituck Inlet f.....				1.20
Halls Peak f.....	68	8	41.1	0.09	Experiment'l Farm.....	71	24	48.4	1.51
Las Cruces f.....	82	16	49.0	0.00	Fair Bluff f.....				1.51
Lordsburg.....	71	40	52.3	0.00	Falkland.....	70	23	47.9	1.51
Los Lunas f.....	72	15	44.2	0.00	Fayetteville f.....				0.97
Monero f.....	62	7	36.6	T.	Flat Rock.....	71	14	44.0	0.41
Olio f.....	68	12	42.8	0.00	Goldsboro f.....	74	25	50.2	2.87
Pecos.....				0.18	Greensboro f.....	72	22	49.3	1.10
Pojuaque.....				0.00	Henderson f.....	75	21	45.6	1.46
Rincon.....	77	16	47.8	0.00	Highlands.....	65	6	40.2	0.60
Roswell f.....	78	20	47.6	0.00	Horse Cove f.....	67	14	43.8	0.75
San Marcial f.....	70	18	44.8	0.00	Lenoir.....	67	18	44.2	0.64
Springer f.....	76	24	51.0	0.00	Littleton f.....	73	22	46.2	0.86
Sulphur Hot Sp'gs f.....	61	10	35.0	T.	Louisburg f.....	73	20	46.2	1.03
<i>New York.</i>					Lumberton f.....	75	26	52.1	1.24
Addison.....	66	15	36.0	1.42	Lynn.....	77	22	44.9	0.92
Akron.....				1.57	Marion.....	75	18	45.1	0.40
Alfred Center.....	65	2	31.1	1.37	Mocksville f.....	75	23	48.4	1.46
Angelica f.....	67	4	32.7	1.70	Moncure f.....	73	22	46.5	1.99
Arade.....	64	6	32.0	1.83	Morganton.....	75	20	46.0	0.55
Arkwright.....	62	13	34.2		Mount Airy f.....	71	14	43.7	1.12
Atlanta.....				0.91	Mount Pleasant.....	74	22	47.6	1.84
Baldwinsville.....	61	15	36.3	3.12	Murphy f.....	78	26	53.7	2.70
Bedford.....	69	12	38.6	4.18	Newbern f.....	75	21	45.4	0.93
Big Sandy.....	60	8	37.7		Oak Ridge f.....	71	17	45.4	1.03
Binghamton.....	68	15	34.9	1.98	Pittsboro.....	73	22	49.7	1.50
Bovina.....				3.21	Raleigh.....	79	23	50.4	2.45
Bovina Center.....				1.80	Rockingham f.....	72	23	47.6	2.48
Brentwood.....	69	7	36.9	6.05	Roxboro.....	72	25	49.4	1.44
Brookfield.....	56	10	35.1	1.95	Salisbury.....	76	24	43.8	1.20
Brooklyn.....	63	23	42.7	4.24	Selma.....	72	18	45.4	0.70
Canton f.....	59	2	31.2	2.75	Shelby.....	70	18	44.5	0.64
Charlotte.....	53	17	35.4		Skyuka.....	73	24	47.4	0.70
Cherry Creek.....				3.51	Sloan f.....	75	27	52.2	2.57
Cooperstown f.....	56	9	31.9	2.72	Soapstone M't f.....	79	17	45.7	2.18
Cortland.....	60	14	34.1	1.98	Southern Pine f.....	80	21	51.0	1.07
De Kalb Junction.....				2.59	Southport f.....	78	30	54.6	3.59
Demeter.....				3.75	Tarboro.....	75	21	49.1	1.63
Deposit.....				1.95	Waynesville f.....	69	14	43.2	0.29
Dunkirk.....				1.07	Weldon f.....	73	20	47.6	1.37
Eden Center.....	75	10	34.0	3.40	Willeyton.....	73	22	48.2	1.23
Elmira f.....	66	16	37.6	1.28	<i>North Dakota.</i>				
Fleming.....	66	15	35.3	1.28	Ashley.....	56	-10	24.2	0.35
Fort Niagara f.....	61	17	36.7	1.36	Berlin f.....	52	-11	23.9	0.75
Friendship.....	66	0	32.6	1.92	Bottineau f.....	48	-16	30.4	0.74
Glens Falls.....	56	7	32.4	3.25	Churchs Ferry.....	52	-15	23.2	0.63
Gloversville.....	58	7	32.1	3.14	Dickinson f.....	65	-7	25.4	T.
Hamilton.....	66	6	32.7	3.32	Ellendale.....	60	-9	25.8	0.59
Hess Road St'n f.....	61	16	36.4	1.08	Fargo f.....	49	-16	22.1	0.59
Honeymead Brook.....	62	10	34.7	2.66	Forman f.....	57	-12	23.4	0.46
Humphrey f.....	67	10	33.6	1.64	Fort Berthold.....	71	-12	28.3	0.20
Hyndsville.....	60	9	33.6		Fort Yates f.....	64	-5	29.5	0.54
Ithaca.....	67	16	35.7	1.94	Gallatin f.....	54	-18	21.3	0.62
Jamestown.....	62	19	35.7		Grafton f.....	48	-22	21.0	0.50
Kings Station.....				2.74	Jamestown f.....	58	-9	26.4	0.18
Lebanon Springs.....	60	5	32.7	3.02	Kelso f.....	53	-20	18.2	1.30
Le Roy.....	64	9	33.0	1.28	Lakota f.....	50	-19	20.1	0.75
Lockport.....	68	11	34.5	1.34	Larimore.....	66	-16	26.7	0.13
Lowville.....	60	0	30.8	2.60	Lemert f.....	50	-18	23.3	0.65
Madison Barracks f.....	65	9	35.9	2.01	McKinney.....	48	-15	24.2	0.19
Malone.....	56	0	28.7	2.70	Milton f.....	46	-19	19.6	0.40
Marlboro.....	66	12	38.4	3.15	Minto f.....	47	-20	22.0	0.50
Mansena.....	72	8	34.0	1.92	Napoleon f.....	55	-10	24.8	0.89
Middletown.....	61	15	37.4		Oakdale f.....	64	-12	28.8	0.21
Minnewaska.....	55	10	31.3	2.50	Power.....	49	-14	20.3	0.77
Mount Morris.....	66	12	36.0	0.54	St. John f.....	49	-15	19.9	0.10
Newark Valley.....				2.23	Steele f.....	56	-15	24.6	0.43
New Lisbon.....	65	7	31.8	2.00	University f.....	48	-15	23.8	0.38
North Hammond f.....	56	8	34.6	2.01	Valley City f.....	57	-8	24.8	0.15
Number Four f.....	59	-1	28.3	2.70	Wahpeton f.....	52	-9	25.1	0.22
Ogdensburg.....	60	4	33.4	2.69	White Earth f.....	50	-16	24.1	0.20
Oneonta.....	66	14	39.4	1.01	Wild Rice f.....				0.55
Oxford.....	65	12	33.6	2.58	Woodbridge f.....	49	-25	19.1	0.50
Palermo f.....	60	8	34.1	4.14	<i>Ohio.</i>				
Penn Yan.....				2.91	Akron.....	61	18	36.7	2.53
Perry City.....	63	11	33.3	2.10	Annapolis.....	69	10	36.0	2.07
Phoenix.....				3.91	Arcanum.....				3.07
Pine City.....				2.37	Ashland.....	65	12	34.4	2.70
Plattsburg B'ks.....	57	5	32.7	2.82	Athens.....	71	14	39.8	3.10
Port Jervis.....	63	12	36.0	3.34	Atwater.....				3.05
Poughkeepsie.....	65	10	36.3	2.89	Auburn.....	66	9	33.0	2.73
Rome.....	66	10	34.8	1.78					
Romulus.....	66	13	36.4	1.44					
Saranac Lake.....	58	2	27.6	2.75					
Setauket f.....	62	19	40.5	6.02					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Ohio—Cont'd.</i>	o	o	o	<i>Ins.</i>	<i>Ohio—Cont'd.</i>	o	o	o	<i>Ins.</i>
Bangorville.....	6	12	31.5	2.29	Sidney.....	67	13	35.9	3.14
Bellefontaine.....	66	15	37.8	3.19	Springboro.....				2.29
Bement.....	58	14	33.4	2.35	Stoutsville.....				1.88
Benton Ridge.....	68	11	36.9	3.03	Swanton.....	69	15	36.4	1.36
Bethany.....	68	15	39.4	1.32	Sylvania.....	59	10	33.7	0.77
Big Prairie.....	66	11	35.5	1.82	Thurman.....	76	15	40.5	1.22
Binola.....	68	13	37.3	2.23	Tiffin f.....	66	16	36.8	2.37
Bissells.....	60	11	34.9	2.50	Upper Sandusky.....	79	19	42.8	2.53
Bladensburg.....	68	10	36.2	2.43	Vanceburg.....	71	14	41.9	1.35
Bloomington.....	68	14	39.4	1.25	Van Wert.....	65	15	35.5	2.01
Bowling Green.....	70	6	35.0	1.72	Vermillion.....	68	14	36.1	1.63
Bucyrus.....	68	10	36.4	0.55	Vickery.....	66	14	36.6	2.05
Caledonia f.....				1.88	Walnut.....				1.80
Cambridge.....	69	11	36.3	2.05	Warren.....	70	8	36.3	3.15
Camp Dennison.....	69	17	39.3	1.59	Warsaw.....	72	9	35.2	1.97
Canal Dover.....	70	11	37.4	3.85	Wauseon.....	66	11	35.0	1.50
Canon f.....	67	16	37.5	3.18	Waverly.....	71	13	40.5	1.41
Carrollton.....	70	12	36.8	3.18	Waynesville.....				1.58
Cedarville.....				2.16	Wellington.....	68	13	37.3	2.88
Celina.....	75	22	43.1	2.53	Westerville.....	66	16	38.2	2.86
Cherry Fork.....	70	6	38.7	1.09	Weymouth.....	68	13	35.2	2.88
Circleville.....				1.10	Wheeler f.....				2.81
Clarksville.....	68	12	38.4	1.84	Willoughby.....				1.69
Cleveland.....	66	20	38.3	2.01	Wooster.....	65	13	36.5	2.41
Clifton.....	68	11	37.0	2.01	Youngstown.....	61	12	36.5	2.62
Coalton.....	71	10	39.0	1.40	Zanesville f.....				1.70
Colebrook.....				2.68	<i>Oklahoma.</i>				
Cynthiana.....	72	13	40.4	2.05	Alva f.....	82	10	46.8	T.
Dayton.....	67	16	40.7	1.77	Anadarko f.....	83	24	53.3	0.00
Dayton f.....				1.81	Arapahoe f.....	78	7	47.0	T.
Defiance.....	65	12	35.1	2.18	Burnett f.....	81	7	52.6	T.
Demos.....	69	13	37.3	1.43	Clifton f.....	79	3	48.7	0.50
Dupont.....	68	12	35.7	0.10	Fort Reno f.....	89	10	48.0	0.00
Ellsworth.....	67	13	35.7	3.10	Fort Sill.....	80	11	48.8	0.00
Elyria.....	71	17	36.7	2.12	Fort Supply f.....	88	6	52.0	0.25
Fairport Harbor									

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Pennsylvania—Con.					S. Carolina—Cont'd.				
Browns Look.....	70	19	39.9	3.73	Hollands Store f.....	74	17	49.3	1.94
Carlisle.....	60	15	35.2	3.03	Kingstree f.....	76	28	55.3	1.95
Cassandra.....	68	15	39.3	1.28	Kingstree b f.....	80	22	52.5	1.81
Clanton f.....	70	17	39.4	2.73	Little Mountain.....	71	26	52.5	2.50
Confluence f.....	64	18	39.4	2.87	McCormick * f.....	71	26	52.5	2.50
Coopersburg.....	68	13	38.2	2.52	Mount Carmel f.....	71	30	52.3	4.20
Davis Island Dam f.....	66	16	36.4	2.43	Pinopolis * f.....	75	32	57.4	3.29
Doylstown.....	68	13	38.2	2.52	Port Royal f.....	76	28	55.1	1.32
Du Bois f.....	68	10	33.4	2.21	St. Georges f.....	76	28	55.1	1.32
Dyberry f.....	65	13	37.1	3.33	St. Matthews f.....	76	28	55.1	2.28
East Manach Chunk.....	62	18	38.5	2.70	St. Stephens f.....	72	28	49.7	2.65
Edinboro * f.....	62	16	33.8	1.88	Shaws Fork * f.....	80	22	54.2	1.55
Elwood Junction f.....	66	16	36.4	1.81	Society Hill f.....	75	27	51.2	0.92
Emporium.....	72	22	49.4	3.28	Spartanburg f.....	78	27	54.5	0.61
Forks of Neshaminy.....	72	22	49.4	3.28	Statesburg f.....	73	28	52.1	1.02
Frederick.....	72	22	49.4	3.28	Timmons ville * f.....	75	42	57.6	2.77
Freeport f.....	72	22	49.4	3.28	Trenton.....	83	26	58.0	2.15
Girardville.....	72	22	49.4	3.28	Trial f.....	71	18	49.6	2.22
Grampian.....	72	22	49.4	3.28	Watts * f.....	71	18	49.6	2.22
Greensboro.....	72	22	49.4	3.28	Yorkville.....	75	25	50.8	2.13
Greenville.....	72	22	49.4	3.28	South Dakota.				
Hamburg.....	72	22	49.4	3.28	Alexandria f.....	62	-10	28.7	0.25
Holidaysburg.....	72	22	49.4	3.28	Armour f.....	65	3	32.8	0.22
Honesdale.....	72	22	49.4	3.28	Ashcroft f.....	70	-3	32.6	0.44
Huntingdon f.....	72	22	49.4	3.28	Bowdle * f.....	60	3	29.1	T.
Johnstown.....	72	22	49.4	3.28	Brookings f.....	57	-5	26.7	0.19
Kennett Square.....	72	22	49.4	3.28	Castlewood f.....	55	-6	25.6	0.13
Killmer * f.....	72	22	49.4	3.28	Clark f.....	58	-4	27.5	0.47
Lancaster.....	72	22	49.4	3.28	Cross f.....	71	2	34.8	0.43
Lansdale.....	72	22	49.4	3.28	Flandreau f.....	58	-5	28.6	0.26
Lebanon.....	72	22	49.4	3.28	Forestburg f.....	64	0	31.2	0.06
Le Roy f.....	72	22	49.4	3.28	Forest City f.....	69	2	31.4	T.
Lewisburg.....	72	22	49.4	3.28	Fort Meade.....	75	1	37.4	1.03
Lock Haven f.....	72	22	49.4	3.28	Frankfort f.....	58	-5	28.0	0.41
Lock No. 4 f.....	72	22	49.4	3.28	Gary f.....	51	-12	24.0	0.28
Lytleppus.....	72	22	49.4	3.28	Greenwood.....	71	6	35.1	0.17
Mahoning f.....	72	22	49.4	3.28	Highmore f.....	70	0	33.1	T.
Oil City f.....	72	22	49.4	3.28	Hotch City f.....	78	0	35.2	0.14
Ottaville.....	72	22	49.4	3.28	Ipawich f.....	50	-7	33.7	0.98
Parker f.....	72	22	49.4	3.28	Kimball f.....	71	3	33.2	0.16
Philadelphia a.....	69	23	42.5	3.35	Millbank.....	57	0	25.8	0.10
Philadelphia b.....	69	23	42.5	3.35	Northville * f.....	59	-2	27.5	0.39
Phoenixville.....	69	23	42.5	3.35	Oelrichs f.....	87	3	34.7	0.60
Point Pleasant.....	69	23	42.5	3.35	Parkston f.....	67	0	32.0	0.20
Pottsville.....	69	23	42.5	3.35	Piedmont.....	67	0	32.0	0.20
Quakertown a.....	69	23	42.5	3.35	Plankinton f.....	70	-4	32.4	0.20
Quakertown b.....	69	23	42.5	3.35	Shiloh.....	65	-4	30.2	0.15
Reading.....	69	23	42.5	3.35	Sioux Falls f.....	59	0	28.9	0.15
Ridgway f.....	69	23	42.5	3.35	Spearsburg f.....	76	8	39.6	1.31
Saegertown.....	69	23	42.5	3.35	Tyndall f.....	68	6	35.2	T.
Salem Corners.....	69	23	42.5	3.35	Vermillion f.....	61	2	33.0	T.
Salisbury f.....	69	23	42.5	3.35	Webster f.....	60	-10	29.6	0.91
Seisholtzville.....	69	23	42.5	3.35	Wessington f.....	71	1	32.8	T.
Sellins Grove.....	69	23	42.5	3.35	Wessington Spgs f.....	71	1	32.8	T.
Shinglehouse.....	69	23	42.5	3.35	Yankton f.....	67	7	33.9	0.05
Smethport.....	69	23	42.5	3.35	Tennessee.				
Smiths Corners.....	69	23	42.5	3.35	Andersonville * f.....	70	25	43.4	0.73
Somerses.....	69	23	42.5	3.35	Arlington f.....	72	14	45.6	0.56
South Bethlehem.....	69	23	42.5	3.35	Ashwood * f.....	70	13	45.7	2.15
South Easton.....	69	23	42.5	3.35	Bolivar f.....	76	14	48.2	1.37
State College.....	69	23	42.5	3.35	Bristol f.....	64	16	41.2	1.17
Stoytown f.....	69	23	42.5	3.35	Brownsville f.....	78	20	50.1	0.23
Swarthmore.....	69	23	42.5	3.35	Byrdstown f.....	74	14	43.8	2.24
Towanda.....	69	23	42.5	3.35	Carthage f.....	76	14	43.6	1.19
Uniontown.....	69	23	42.5	3.35	Clarks ville.....	76	14	43.6	1.19
Warren f.....	69	23	42.5	3.35	Clinton f.....	76	14	43.6	1.19
Wellsville * f.....	69	23	42.5	3.35	Columbia.....	76	14	43.6	1.19
West Chester.....	69	23	42.5	3.35	Covington a f.....	74	22	47.4	0.70
West Newton f.....	69	23	42.5	3.35	Covington b f.....	77	20	50.5	0.69
Westtown.....	69	23	42.5	3.35	Dyersburg f.....	75	16	48.4	0.40
Wilkesbarre f.....	69	23	42.5	3.35	Florence Station f.....	74	11	44.4	2.33
York f.....	69	23	42.5	3.35	Franklin f.....	75	9	44.0	1.69
Rhode Island.					Greenville f.....	70	17	44.1	0.37
Bristol.....	61	15	39.1	4.14	Hohenwald.....	67	10	43.0	1.97
Kingston.....	63	11	36.9	5.26	Jacksboro * f.....	72	22	40.4	2.04
Lonsdale.....	63	11	36.9	5.26	Jackson * f.....	74	22	45.4	0.55
Newport.....	64	18	41.7	3.54	Johnsonville.....	74	22	45.4	0.55
Pawtucket.....	64	17	37.1	3.54	Loudon.....	75	15	45.0	1.74
Providence a.....	64	16	38.3	3.52	Lynnville * f.....	75	15	45.0	1.74
Providence b.....	64	16	38.3	3.52	McMinnville f.....	78	22	46.8	1.13
South Carolina.					Milan f.....	71	14	45.5	0.52
Aiken.....	74	25	53.4	1.70	Newport * f.....	70	21	40.6	0.60
Allendale f.....	76	26	53.3	0.92	Nunnally * f.....	75	16	46.8	2.38
Anderson f.....	74	24	50.8	3.34	Palmetto f.....	65	18	46.0	1.74
Batesburg f.....	74	24	50.8	3.34	Parksville * f.....	65	18	46.0	1.74
Blackville f.....	74	24	50.8	3.34	Riddletown f.....	75	15	44.3	2.12
Blenheim * f.....	78	26	55.4	1.03	Rockwood f.....	75	15	44.3	2.12
Branchville.....	78	26	55.4	1.03	Rogersville * f.....	72	30	44.3	1.30
Camden f.....	78	26	55.4	1.03	St. Bethlehem.....	74	18	46.2	0.75
Central.....	78	26	55.4	1.03	Springdale * f.....	70	20	44.5	2.46
Cheraw a f.....	75	23	50.0	2.09	Trenton.....	78	13	45.8	0.50
Cheraw b f.....	75	23	50.0	2.09	Tullahoma * f.....	75	20	46.2	1.10
Conway f.....	75	23	50.0	2.09	Waynesboro * f.....	80	15	45.3	1.50
Cross Hill * f.....	74	26	52.1	3.87	Texas.				
Edinham f.....	73	24	48.9	1.85	Albany * f.....	75	28	53.1	0.00
Flint Hill f.....	73	24	48.9	1.85	Alice f.....	90	37	66.9	0.16
Florence f.....	77	30	53.6	1.81	Arlington f.....	85	25	56.9	0.00
Georgetown f.....	76	30	52.6	2.15	Arthur City f.....	86	24	58.2	0.10
Greenwood f.....	74	21	51.2	1.07	Aurora * f.....	86	24	58.2	0.10
Greenwood f.....	76	24	51.0	2.38	Austin a.....	78	32	59.7	0.00
Hardeeville.....	77	29	55.8	3.50	Austin b * f.....	81	35	61.0	0.00

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Texas—Cont'd.					Vermont—Cont'd.				
Boerne * f.....	77	29	54.6	0.07	Norwich * f.....	55	5	31.0	2.37
Brady f.....	84	24	57.1	0.00	St. Johnsbury.....	56	0	30.0	1.97
Brasoria f.....	83	39	63.0	1.76	Simonsville.....	56	5	27.8	.....
Brenham f.....	83	33	62.0	0.41	Stratford * f.....	54	0	29.5	3.42
Burnet * f.....	85	32	60.1	0.00	Vernon * f.....	59	6	32.0	2.83
Camp Eagle Pass.....	88	30	61.0	0.00	Wells.....	61	5	31.3	2.62
Coleman * f.....	86	30	54.3	0.00	Woodstock.....	61	0	20.6	2.58
College Station.....	81	30	59.0	0.30	Virginia.				
Columbia f.....	83	36	62.6	0.90	Abingdon f.....	67	21	42.8	1.20
Corsicana b f.....	84	26	55.1	1.25	Alexandria.....	67	21	42.8	1.66
Cuero f.....	86	34	63.8	0.25	Ashland f.....	79	20	46.3	2.79
Dallas f.....	83	24	54.8	0.43	Avon f.....	70	21	43.8	0.53
Durham f.....	84	31	61.4	0.10	Bedford City.....	65	20	44.1	1.35
Duval * f.....	83	22	56.8	0.13	Big Stone Gap f.....	70	15	38.7	1.71
Estelle f.....	83	22	56.8	0.13	Birds nest * f.....	76	27	48.0	1.30
Flower Bluff f.....	81	39	66.4	0.03	Blacksburg.....	66	10	39.4	0.85
Fort Brown f.....	86	40	68.0	0.29	Buchanan f.....	71	15	44.7	2.00
Fort Clark.....	84	30	61.8	0.00	Buckingham f.....	71	15	44.7	2.00
Fort Hancock.....	82	11	48.9	0.00	Callaville f.....	73	20	46.2	1.31
Fort McIntosh.....	92	35	66.0	0.00	Christiansburg f.....	73	26	49.0	0.88
Fort Ringgold f.....	94	38	66.8	0.00	Graham's Forge.....	64	12	40.8	0.47
Fort Stockton f.....	83	27	57.3	0.23	Hampton.....	73	26	49.0	0.88
Fort Worth f.....	83	27	57.3	0.23	Hot Springs.....	63	9	38.5	1.00
Fredericksburg * f.....	80	25	55.6	0.00	Irwin f.....	71	12	45.3	1.92
Goliad.....	86	16	53.0	0.00	Lexington f.....	71	17	42.3	0.98
Graham f.....	86	16	53.0	0.00	Nottoway.....	73	17	46.5	1.39
Grape Vine f.....	84	24	57.2	0.32	Petersburg f.....	76	27	49.4	1.78
Hale Center f.....	84	20	55.4	0.00	Richmond (near) f.....	76	21	45.9	1.53
Hallettsville f.....	85	31	61.5	0.40	Richmond b f.....	70	18	47.2	1.00
Happy.....	82	13	47.5	T.	Rocky Mount f.....	70	18	47.2	1.00
Hartley f.....	72	6	39.5	T.	Salem f.....	74	20	47.5	0.78
Hearne f.....	82	30	61.4	1.15	Smithville f.....	70	22	46.1	1.15
Hewitt.....	86	16	53.0	0.00	Spottsville f.....	70	31	45.0	1.20
Houston f.....	80	34	59.0	0.84	Stannardsville f.....	67	17	43.4	1.61
Huntsville f.....	84	32	61.6	0.65	Staunton f.....	67	14	42.8	1.22
Jefferson * f.....	79	30	53.0	0.40	Stephens City f.....	69	19	41.8	1.19
Kent.....	86	16	53.0	0.00	Warsaw f.....	74	24	45.3	2.45
Lampasas * f.....	87	29	57.4	T.	Whittles Depot f.....	75	16	47.4	1.34
Leakey f.....	81	35	61.0	0.00	Wytheville f.....	64	14	39.1	2.14
Llano * f.....	82	30	58.5	0.00	Washington.				
Longview f.....	86	30	57.5	1.60	Aberdeen f.....	62	28	46.0	10.84
Luling f.....	85	32	61.4	0.00	Abercotes.....	58	23	42.0	6.30
Marshall f.....	80	28	57.1	1.80	Blaine f.....	61	20	38.8	0.11
Menardville * f.....	81	25	54.3	0.00	Bridgeport f.....	54	18	36.6	15.46
Midland f.....	91	24	57.4	0.00	Cascade Tunnel f.....	65	21	45.4	0.37
Mountain Spring f.....	84	21	56.8	0.65	Centerville f.....	63	19	44.0	2.02
New Braunfels f.....	83	31	57.6	0.00	Conconully.....	63	20	39.0	0.49
Orange f.....	79	36	59.2	3.30	East Sound f.....	57	30	45.2	6.18
Paris f.....	81	24	55.9	1.86	Elbe.....	58	15	39.4	0.99
Roby f.....	80	18	53.0	0.00	Ellensburg f.....	60	20	42.8	1.75
Rockport * f.....	80	40	64.4	0.00	Everett.....	62	27	45.6	5.45
Rock Springs f.....	83	26	58.7	0.00	Ferry f.....	65	24	47.8	7.55
Round Rock f.....	84	28	62.6	0.00	Fort Simcoe.....	69	25	44.8	0.99
San Antonio.....	86	32	59.8	0.09	Fort Spokane.....	62	10	40.4	1.42
San Marcos a f.....	86	30	60.6	0.00	Fort Townsend.....	57	28	44.9	3.39
Sherman f.....	80	22	56.0	1.18	Grand Mound.....	65	25	46.5	8.54
Silver Falls.....	83	20	51.6	0.00	Hunters f.....	52	12	36.0	0.81
Sulphur Springs.....	88	32	64.1	1.10	Index f.....	56	35	46.2	16.61
Temple f.....	84	28	58.4	1.00	Kennewick f.....	71	19	48.4	0.15
Tyler f.....	82	30	56.6	1.96	Lakeside f.....	59	23	41.1	0.89
Victoria * f.....	83	43	69.2	0.63	Lapush f.....	61	29	46.8	9.91
Waco f.....	84	30	60.0	0.68	Madrone * f.....	59	27	47.3	6.17
Weatherford f.....	83	25	56.7	0.10	Moxee Valley f.....	64	12	42.3	0.38
Wichita Falls f.....	90	17	58.4	T.	Olga f.....	56	33	45.6	6.22
Utah.					Pine Hill * f.....	66	24	46.4	1.66
Blue Creek * f.....	70	13	43.1	0.00	Pullman f.....	60	20	42.2	2.05
Cisco f.....	68	11	41.8	0.00	Rosalia f.....	65	19	41.8	1.38
Coalville f.....	67	6	36.6	0.44	Silver Creek * f.....	64	26	46.2	7.15
Corinne * f.....	62	10	35.9	0.15	Snohomish f.....	61	27	46.7	5.74
Deseret f.....	9			0.00	Stampepe f.....	68	20	41.0	10.30
Emery.....				0.20	Tacoma f.....	59	26	46.0	6.51
Fillmore f.....	77	7	43.6	0.31	Union City * f.....	56	28	43.4	10.28
Fort Du Chene f.....	65	18	41.0	0.00	Vashon f.....	58	21	42.2	8.09
Green River f.....	67	5	34.0	0.00	Waterville f.....	54	16	36.6	1.20
Grouse Creek.....	68	5	32.8	0.00	Wenatchee Lake f.....	50	20	36.5	4.05
Heber.....	64	10	39.0	0.00	West Ferndale f.....	57	26	43.2	6.73
Kelton * f.....	61	10	38.2	0.18	West Virginia.				
Koosharem f.....	66	9	38.4	0.01	Beverly f.....	64	8	38.0	2.77
Lake Station * f.....	60	10	33.7	0.00	Bloomery f.....	66	13	37.1	0.75
Levan f.....			39.4	0.00	Buckhannon a f.....				3.38
Loa f.....	65	8	36.6	0.00	Burlington f.....	70	11	37.9	0.25
Logan.....	64	15	42.8	T.	Central Station f.....				2.97
Millville.....				0.00	Charleston f.....				2.39
Moab f.....	71	13	42.6	0.00	Creston f.....	75	14	38.6	3.20
Mount Pleasant * f.....	70	18	44.8	0.00	Davis f.....	75	5	37.9	2.53
Ogden * f.....	60	22	41.6	0.25	Elkhorn f.....	68	18	43.1	1.85
Parowan f.....	67	15	43.0	T.	Ella f.....	66	18	39.4	2.43
Promontory * f.....	64	5	38.0	0.00	Fairmont f.....				2.38
St. George f.....	82	16	48.5	0.00	Glenville f.....	70	14	39.8	2.73
Scipio.....				0.00	Grafton f.....	72	12	39.0	2.40
Singletree * f.....	66	8	36.6	0.00	Harpers Ferry f.....				0.51
Snowville f.....	65	3	37.1	0.00	Hinton f.....				1.03
Soldier Summit f.....	59	2	32.0	0.00	Leachtown f.....				1.95
Terrace * f.....	66	16	39.0	0.00	Madison f.....	68	13	37.4	2.62
Thistle.....	66	16	40.8	0.25	Marlinton f.....	82	8	38.5	1.84
Vernal.....	72	12	40.8	0.00	Martinsburg f.....	68	20	41.3	1.02
Vermont.					Morgantown a f.....				2.14
Brattleboro.....	63	9	33.4	3.00	Morgantown b f.....	80	19	43.9	3.47
Burlington f.....	56	11	34.7	1.96	New Cumberland f.....	70	18	40.5	2.78
Cornwall.....	57	8	31.7	3.64	New Martinsville.....	71	15	41.4	1.98
Enosburg Falls f.....	59	0	30.6	2.20	Nuttallburg f.....	82	9	39.4	2.10
Hartland f.....	60	3	29.8	2.58	Phillippi f.....				2.40
Irasburg.....	58	- 6	27.5	3.68					
Jacksonville.....	57	14	27.5	2.83					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
W. Virginia—Cont'd				Ins.	Wisconsin—Cont'd				Ins.
Point Pleasant †	76	18	43.1	1.04	Menomonie	52	-10	21.8	1.93
Powellton	66	16	40.1	2.49	Neillsville †	50	-4	26.8	2.01
Raleigh	65	13	36.9	0.57	Oconomowoc †	52	4	31.2	2.03
Rowlesburg †				3.44	Oconto	53	1	29.8	3.96
Sandyville †	71	15	39.3	1.70	Oscoda †	54	-5	24.2	0.13
Spencer	71	12	37.5	0.77	Oshkosh †	49	0	31.0	1.35
Tannery	75	12	39.2	2.65	Pepin	56	-4	27.8	0.78
Weston †	70	16	42.2	2.45	Pine River	50	-1	28.6	2.10
Wheeling †	68	19	42.2	1.89	Portage †	52	3	32.4	1.61
Wheeling †				2.19	Port Washington	59	0	28.2	1.50
Wisconsin					Prairie du Chien	52	5	33.4	
Amherst	52	-2	27.0	3.05	Racine †	52	5	33.4	
Antigo	50	-6	27.2	2.02	Reedsburg	49	1	29.8	1.25
Ashland †	45	12	28.8	1.24	Royalton	56	-2	28.4	2.74
Baraboo †				1.67	Sharon †	54	1	29.8	2.38
Barron †	48	-8	25.6	1.40	Shawano	52	-2	28.9	3.00
Bayfield	60	2	28.7	1.20	Sheboygan †	48	6	33.0	
Beaver Dam	52	1	31.3	2.95	Spooner †	51	0	25.8	
Bellville	51	0	28.8	2.35	Stevens Point †	50	-3	27.8	2.11
Beloit	51	6	32.5	2.65	Sturgeon B. Canal †	50	6	31.8	
Black River Falls †	52	-3	27.2	2.15	Two Rivers †	50	8	34.5	
Centralia	52	-3	27.3	1.41	Valley Junction †	51	-3	29.2	1.23
Chilton	51	1	29.0	2.16	Viroqua	49	0	28.2	1.33
Chippewa Falls †				1.78	Watertown †	51	-2	28.6	2.43
City Point	64	-5	27.0	1.74	Waukesha †	51	2	30.9	2.08
Columbus	52	1	27.0	2.35	West Bend	52	8	34.6	2.70
Crandon †	48	-10	24.0	2.60	Westfield †	49	-2	28.6	1.76
Delavan †	52	5	30.8	2.13	Weston †	44	0	25.7	1.49
Depere †	52	1	29.8	2.37	Wyoming				
Eau Claire	52	-1	26.0	1.23	Fort Laramie †	76	2	41.0	0.09
Fond du Lac †	51	-6	24.4	2.74	Fort Washakie	70	-12	37.0	0.22
Harvey †	59			3.71	Fort Yellowstone †	58	-1	36.0	0.15
Hayward †	48	-10	21.0	1.29	La Barge	62	-9	30.8	0.00
Hillsboro	49	1	27.8	1.34	Laramie	59	-15	36.2	0.05
Janesville	54	7	32.3	2.40	Lusk †	71	-5	37.0	T.
Kenosha †	58	10	38.6		Saratoga †	60	-16	34.4	0.40
Koepnick †	62	4	26.7	2.00	Sheridan	76	-4	38.0	0.80
Lancaster †	52	2	28.2	2.05	Sundance	67	-3	33.6	0.98
Lincoln †	48	4	30.4	1.63	Mexico				
Madison †	50	3	30.8	2.12	Ciudad P. Diaz	85	36	61.0	0.02
Meadow Valley †	50	-5	26.6	1.21	Leon de Aldamas	77	38	57.3	0.04
Medford †	51	-9	24.8	1.58	Mexico	72	38	54.4	0.16
					Puebla	73	42	57.2	0.14
					West Indies				
					Grand Turk Island				3.08

Reports received too late to be used in general discussion of weather for November, 1894.

Alabama.						Missouri.					
Livingston	80	19	52.0	1.38		Carthage					0.22
Alaska.						Montana.					
Killisnoo	43	19	33.6	5.35		Fort Logan	64	- 4	36.5		0.65
Arizona.						Nevada.					
Dudleyville	87	26	61.8	0.00		White Sul. Springs.	63	6	37.0		0.14
Rye	78	27	54.4	0.00							
California.						New Hampshire.					
Anderson *1.	79	28	49.7	0.54		Arthur					0.00
Florin *2.	80	34	57.1	0.47		Berlin *	56	- 6	28.4		....
Point George L. H.				2.90		New York.					
San Bernardino	90	34	60.0	0.00		Potsdam 1.	53*	3	31.2	1.78	
Wenrich Ranch.				0.01		Wedgwood	64	9	32.8	1.86	
Colorado.						Oklahoma.					
Castle Rock.	71			0.60		Sac and Fox Agency	82	4	50.7	0.00	
Connecticut.						Oregon.					
Colebrook River.				3.82		Corvallis a.	68	24	45.9	2.10	
Georgia.						Texas.					
Brag	81	21	55.4	1.13		Crook	75	10	43.2		....
Hephzibah *2.	72	30	51.9	3.70		Forest Grove	68	25	46.2	4.74	
Indiana.						Utah.					
Huntingburg	68	16	41.4	0.60		Newport		33		6.01	
Iowa.						South Carolina.					
Maxon	65	4	32.5	2.03		Tillamook R'k L. H.				6.37	
Mount Pleasant *2.	57		35.8	1.62		Longshore					
Toledo *1	58	1	32.4	0.97			74	23	48.6	5.29	
Kansas.						South Dakota.					
Altoona *2.	71	8	40.6	1.05		Aberdeen	60	- 4	31.0	2.97	
Cunningham	79	2	43.6	T.		Farmingdale				0.31	
Frankfort	78	12	42.4	0.50		Faulkton	65	- 4	28.4	0.20	
Grainfield *2.	80	12	48.2	0.00		Rochford				0.93	
Grinnell *2.	80	10	38.7			Silver City				2.35	
Halstead	76	3	42.4	0.02		Tenn.					
Lawrence 1.	72	12	42.1	0.93		Sierra Blanca	88	27	63.1	0.00	
Medicine Lodge				0.07		Washington.					
Minnesota.						Idaho.					
Red Lake	48	-23	21.4	0.44		Chehalis	62	23	45.5	2.85	

Received too late for publication in October, 1894.

Arizona.	Dudleyville	96	35	65.6	0.81	California—Cont'd	Sutter Creek	86	34	56.4	2.95
California.	Flagstaff	78	16	51.4	0.40	Colorado.	Garnett				0.00
Colorado.	Anderson	88	40	57.2	2.35	Idaho.	Gunnison	75	13	43.4	
Connecticut.	Ballast Point L. H.				0.00	Illinois.	Rangely	62	20	39.1	0.38
Delaware.	Chino	95	39	62.3	0.00	Missouri.	Santa Clara				0.50
Florida.	Mutah Flat				0.85	Nebraska.	Rushville	84	31	57.6	1.12
Georgia.	Oleta	86	40	56.3	4.50	Texas.	Moor	89	30	57.5	1.33
Idaho.	Point George L. H.				2.86						
Illinois.	Santa Barbara	92	48	62.6	0.68						

Reports received too late, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Kansas.				Ins.	New Mexico.				Ins.
Collier	92	32	53.6	T.	Estalina Springs	78	20	52.3	0.64
Grainfield	90	42	66.0	0.20	New York.				
Grinnell	90	36	55.6		Wedgwood	79	27	51.3	4.22
Phillipsburg	90	26	58.9		North Carolina.				
Quinter	84	23	58.9	T.	Greenville				6.44
Sharon Springs	98	30	56.8	1.00	Oklahoma.				
Wa Keeney	86	30	58.6	T.	Sac and Fox Agency	92	32	64.2	1.20
Winona	86	36	61.4	0.00	Oregon.				
Massachusetts.					Bay City	67	34	51.2	10.96
Concord	79	28	51.1	4.20	Utah.				
Waltham				5.92	Emery				0.35
Minnesota.					Vermont.				
Hutchinson	73	26	47.0	2.00	Irashburg	67	30	45.8	4.03
Montana.					West Virginia.				
White Sul. Springs	78	10	45.2	0.76	Spencer	81	25	54.5	2.90
New Hampshire.					Mexico.				
Berlin	68	25	44.6		Topolobampo	94	68	82.9	0.22

EXPLANATION OF SIGNS.

*Extremes of temperature from observed readings of dry thermometer.
†Weather Bureau instruments.
A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:
1 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 4.
2 Mean of 8 a. m. + 8 p. m. + 2.
3 Mean of 7 a. m. + 7 p. m. + 2.
4 Mean of 6 a. m. + 6 p. m. + 2.
5 Mean of 7 a. m. + 2 p. m. + 2.
6 Mean from readings at various hours reduced to true daily mean by special tables.
7 Mean from hourly readings of thermograph.
8 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 3.
9 Mean of sunrise and noon.
10 Mean of sunrise, noon, sunset, and midnight.
The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.
An Italic letter following the name of a station, as "Livingston a," "Livingston b," indicates that two or more observers, as the case may be, are reporting from the same station. A small Roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "a" denotes 14 days missing.
No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.
Corrections: California, San Rafael, October, 1894, make minimum temperature 40°, instead of 28°, and mean temperature, 60.3°, instead of 54.4°.

TABLE III.—Data from Canadian stations for the month of November, 1894.

Station.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.	
	Inches.	Inches.	Inches.	°	°	Inches.	Inches.	
St. John's, N. F.	29.70	29.85	— .08	35.4	— 1.6	4.14		n.
Sydney, N. S.	29.83	29.89	— .07	35.6	— 0.9	5.65	+ 0.04	sw.
Grindstone, G. St. L.	29.79	29.82		34.4		5.12		sw.
Halifax, N. S.	29.82	29.95	— .05	35.2	— 1.8	5.72	+ 0.50	w.
Grand Manan, N. B.	29.90	29.95		35.5		5.13	+ 0.90	w.
Yarmouth, N. S.	29.90	29.98	— .06	38.0	— 2.0	4.45	+ 1.51	sw.
Saint Andrews, N. B.	29.78	29.93		33.1		3.39	+ 0.17	sw.
Charlottetown, P. E. I.	29.86	29.90		34.4		3.82	+ 0.09	w.
Chatham, N. B.	29.88	29.90	— .08	28.6	— 1.9	2.87	+ 0.55	w.
Father Point, Que.	29.88	29.91	— .05	26.7	— 2.3	1.85	+ 0.61	sw.
Quebec, Que.	29.62	29.96	— .05	26.2	— 2.8	3.04	+ 0.98	sw.
Montreal, Que.	29.78	30.00	— .02	29.9	— 2.6	2.49	+ 0.68	sw.
Rockliffe, Ont.	29.44	29.97	— .03	25.1	— 3.9	1.82	+ 0.83	sw.
Kingston, Ont.	29.70	30.03	— .01	33.2	— 2.3	2.90	+ 0.52	w.
Toronto, Ont.	29.64	30.04	— .01	33.6	— 2.9	2.90	+ 0.61	w.
White River, Ont.	28.62	30.05		17.0	— 3.5	1.66	+ 0.23	sw.
Port Stanley, Ont.	29.40	30.07	+ .02	34.2		2.34	+ 0.81	w.
Saugeen, Ont.	29.28	30.03	+ .01	32.2	— 3.3	3.02	+ 0.88	sw.
Parry Sound, Ont.	29.28	30.00	— .02	29.0	— 3.0	3.64	+ 0.57	sw.
Port Arthur, Ont.	29.27	30.01	.00	22.8	— 1.7	1.26	+ 0.72	w.
Winnipeg, Man.	29.17	30.05	— .02	17.3	— 0.7	1.87	+ 0.88	sw.
Minneapolis, Man.	28.12	30.02	— .02	17.2	+ 0.7	1.44	+ 0.64	sw.
Qu'Appelle, Assiniboia.	27.68	30.06	+ .03	17.7	+ 1.8	0.82	+ 0.22	sw.
Medicine Hat, Assiniboia.	27.66	30.04	.00	28.6	+ 1.6	1.08	+ 0.75	sw.
Swift Current, Assiniboia.	27.37	30.07	+ .01	22.4	+ 0.4	0.22	+ 0.29	w.
Calgary, Alberta.	26.36	30.03	— .01	24.3	— 1.7	1.11	+ 0.76	w.
Prince Albert, Sask.	28.44	30.04		16.6		0.38		w.
Edmonton, Alberta.	27.60	30.04	+ .06	22.6	— 4.4	1.03	+ 0.81	sw.
Battleford, Saskatchewan.	28.20	30.02		17.8		0.23		sw.
Spences Bridge, B. C.	29.26	30.10		38.0		1.21		sw.
Hamilton, Bermuda.	30.02	30.18	+ .13	69.0		3.30		sw.
Esquimaux.	30.10	30.13		44.4		5.99		sw.
October, 1894.								
Esquimaux.	29.94	29.97		46.6		4.26		sw.

TABLE IV a.—Hourly sunshine as deduced from sunshine recorders, November, 1894.

Station.	Instrument.	Percentage for each hour of local mean time ending with the respective hour.																Monthly summary.			
		A. M.								P. M.								Instrumental record.			Personal estimate.
		5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	
Baltimore, Md.	T.			41	47	59	72	77	82	83	84	77	66	60				Hours.	Hours.		61
Bismarck, N. Dak.	P.			22	13	26	40	41	37	44	42	45	47	23				209.9	301.2	70	61
Boston, Mass.	T.			38	39	46	51	55	58	48	51	48	39					104.6	279.8	37	38
Buffalo, N. Y.	T.			5	4	18	40	37	39	39	32	15	6					143.0	293.1	49	46
Chicago, Ill.	T.			25	24	31	36	42	46	46	37	32	38					69.9	292.0	24	16
Cincinnati, Ohio	P.			56	66	66	59	57	52	52	52	50	50	48				110.7	295.5	37	35
Cleveland, Ohio	P.			32	26	31	35	41	40	39	37	28	24	21				167.1	301.4	55	44
Columbus, Ohio	P.			28	41	47	60	63	66	67	61	53	41	38				96.7	296.3	33	27
Denver, Colo.	P.			78	77	71	85	85	87	90	80	75	76	82				159.5	299.8	53	47
Des Moines, Iowa	T.			40	41	32	34	38	52	55	48	44	47	36				242.2	300.1	81	62
Detroit, Mich.	T.			10	33	28	45	54	54	51	45	31	22					126.2	295.3	43	41
Dodge City, Kans.	P.			71	76	79	79	79	84	87	87	85	76	61				123.6	293.7	42	37
Eastport, Me.	P.			35	37	48	51	49	52	52	54	51	40	32				241.4	304.2	79	67
Galveston, Tex.	P.			46	58	74	77	84	80	80	83	82	73	69				134.9	287.0	47	35
Helena, Mont.	P.			40	19	27	48	54	47	49	51	49	48					241.7	320.9	75	75
Kansas City, Mo.	P.			71	71	70	76	76	75	72	73	70	62					125.3	280.5	45	45
Key West, Fla.	T.			55	55	67	84	85	87	80	78	71	64	42				213.5	303.0	70	56
Little Rock, Ark.	T.			64	60	65	74	77	81	76	75	73	71	76				342.0	328.2	74	56
Louisville, Ky.	T.			51	50	56	73	77	61	60	62	53	55	50				223.6	311.0	72	66
Memphis, Tenn.	P.			66	60	71	73	74	79	82	83	78	78	50				170.3	303.7	56	44
New Haven, Conn.	T.			47	46	51	57	59	54	55	61	58	49					233.5	309.7	75	69
New Orleans, La.	T.			47	48	53	60	69	70	66	64	64	50	39				158.1	297.2	53	53
New York, N. Y.	T.			33	30	33	60	67	62	68	69	60	54	39				197.3	322.2	61	61
Philadelphia, Pa.	T.			42	45	48	57	68	67	67	57	55	54	52				167.0	296.9	56	50
Portland, Me.	T.			28	31	50	53	54	48	45	41	40	29					171.0	299.3	57	51
Portland, Oreg.	P.			0	0	5	18	23	25	37	52	49	42	41				90.6	207.3	44	38
Rochester, N. Y.	T.			10	11	13	19	28	22	21	19	12	1	0				81.8	287.4	28	36
St. Louis, Mo.	T.			42	47	55	63	75	70	71	69	66	67	54				44.2	292.1	15	19
Salt Lake City, Utah	T.			73	60	69	82	80	95	93	88	83	67	67				192.0	302.2	64	63
San Diego, Cal.	P.			32	37	46	46	72	82	87	84	86	90	59				235.9	297.5	80	68
San Francisco, Cal.	P.			30	38	56	67	72	88	92	94	95	98	68				212.3	314.8	67	59
Santa Fe, N. Mex.	P.			92	94	93	93	93	88	88	92	92	87	100				233.2	304.4	77	72
Savannah, Ga.	P.			55	55	59	68	70	72	76	79	76	69	64				282.0	308.7	91	82
Spokane, Wash.	P.			0	11	19	24	28	27	22	31	33	34	33				215.9	316.7	68	60
Tucson, Ariz.	P.			97	93	94	97	98	94	97	100	98	97	92				72.1	278.1	26	19
Vicksburg, Miss.	T.			42	46	60	79	79	84	81	85	84	73	71				303.3	315.7	96	86
Washington, D. C.	P.			38	38	48	59	63	73	83	83	80	72	62				229.3	315.3	73	72
Wilmington, N. C.	T.			35	39	57	64	71	78	76	76	73	66	52				197.4	301.8	65	66
																		199.4	312.0	64	66

* Hourly percentages and instrumental record for 22 days; personal estimate for 30 days. † Record for 21 days; personal estimate for 30 days. ‡ Photographic record from 1st to 13th, inclusive; thermometric record from 14th to 30th, inclusive.

TABLE IV b.—Hourly precipitation, November, 1894.

Station.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Total.
Atlanta, Ga.	0.05	0.02	T.	T.	T.	T.	T.	T.	T.	0.00	T.	0.00	T.	0.00	0.00	0.00	0.00	0.04	0.11	0.10	0.16	0.29	0.04	0.09	0.90
Baltimore, Md.	T.	T.	0.02	0.06	0.09	0.19	0.40	0.30	0.23	0.17	0.11	0.08	0.10	0.02	0.01	0.01	0.02	0.02	T.	T.	0.03	0.09	0.02	T.	2.01
Bismarck, N. Dak.	0.02	0.03	T.	T.	T.	T.	T.	0.05	0.01	0.03	0.04	0.04	0.04	0.01	0.00	0.00	0.00	T.	T.	T.	0.03	0.07	T.	T.	0.39
Boston, Mass.	0.07	0.03	0.06	0.06	0.12	0.13	0.11	0.07	0.01	0.03	0.04	0.04	0.04	0.15	0.22	0.16	0.13	0.16	0.17	0.11	0.13	0.16	0.16	0.15	3.17
Buffalo, N. Y.	0.11	0.12	0.08	0.22	0.26	0.09	0.03	0.02	0.03	0.07	0.03	0.07	0.13	0.13	0.14	0.01	T.	0.02	0.06	0.05	0.02	0.02	0.03	1.84	
Chicago, Ill.	0.02	0.01	0.01	T.	0.00	0.00	0.06	0.01	T.	0.03	0.03	0.11	0.08	0.05	0.07	0.04	0.01	0.01	0.01	T.	T.	T.	0.01	0.02	0.61
Cincinnati, Ohio	0.01	0.02	0.01	0.01	0.02	0.02	0.03	0.02	0.03	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.06	0.07	0.17	0.09	0.10	0.12	0.04	T.	0.94
Cleveland, Ohio.	0.03	0.03	0.02	0.03	0.03	0.03	0.04	0.06	0.07	0.07	0.07	0.08	0.02	0.02	0.03	0.05	0.06	0.04	0.04	0.03	0.04	0.06	0.09	0.11	1.29
Denver, Colo.	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	T.	0.00	T.	0.01	T.	0.00	T.	0.03	0.03	0.04	0.03	2.22
Detroit, Mich.	0.01	0.01	0.03	0.02	0.02	0.04	0.05	T.	0.02	0.04	0.03	0.03	0.07	0.09	0.11	0.05	0.03	0.01	0.02	0.04	0.16	0.12	0.09	0.06	1.15
Dodge City, Kans.	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	0.01	T.	T.	0.00	T.	0.01	0.01	T.	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Duluth, Minn.	0.19	0.04	0.05	0.12	0.05	0.09	0.14	0.05	0.03	0.02	0.05	0.05	0.08	0.10	0.03	0.06	0.08	0.08	0.14	0.05	0.03	0.13	0.10	0.13	1.89
Eastport, Me.	0.00	0.02	0.06	0.12	0.01	0.00	0.00	0.00	0.00	T.	0.04	0.01	T.	0.38	0.01	0.01	0.01	T.	0.00	0.01	T.	0.00	T.	0.07	1.54
Galveston, Tex.	0.02	0.03	0.06	0.04	T.	T.	T.	0.04	T.	T.	0.06	0.05	0.01	0.02	0.04	0.09	0.31	0.17	0.13	0.06	0.06	0.10	0.08	0.08	1.51
Indianapolis, Ind.	T.	0.01	0.03	0.29	0.18	0.11	0.12	0.41	0.21	0.06	0.01	0.02	0.03	0.04	0.08	0.26	0.23	0.59	0.24	0.46	0.16	0.06	0.01	0.11	3.72
Jupiter, Fla.	0.17	0.02	0.02	0.04	0.21	0.06	0.54	0.07	T.	0.20	0.00	0.00	0.01	0.04	0.05	0.23	0.26	0.31	0.05	0.09	0.02	0.07	0.10	0.37	2.93
Kansas City, Mo.	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.01	0.01	T.	0.01	0.01	0.02	0.01	0.07	0.04	0.58	0.34	0.35	0.14	0.03	1.61
Key West, Fla.	0.03	0.06	0.09	0.03	0.00	0.33	0.02	T.	0.03	0.00	T.	0.00	T.	T.	T.	0.01	0.04	0.14	0.10	0.03	T.	0.00	0.01	0.01	1.04
Louisville, Ky.	0.00	0.00	0.00	0.00	0.02	0.12	0.04	0.04	0.04	T.	T.	T.	T.	T.	T.	0.01	0.02	0.13	0.09	0.03	0.04	0.00	T.	0.01	0.61
Marquette, Mich.	0.01	0.00	0.00	0.12	0.15	0.02	0.02	0.15	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	T.	T.	T.	0.00	0.00	0.01	0.49
Memphis, Tenn.	0.02	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.02	0.09	0.16	0.12	0.22	0.18	0.14	0.04	0.03	0.04	0.03	0.02	0.03	0.04	0.03	0.02	1.67
Milwaukee, Wis.	0.05	0.06	0.06	0.04	0.09	0.07	0.03	0.04	T.	0.00	0.00	0.02	0.16	0.39	0.12	0.13	0.10	0.17	0.07	0.03	0.34	0.21	0.50	0.08	2.79
Nantucket, Mass.	0.15	0.07	0.07	0.17	0.14	0.04	T.	0.27	0.10	T.	0.00	0.00	0.00	0.00	T.	0.01	0.04	0.08	T.	T.	T.	T.	0.04	0.74	1.92
New Orleans, La.	0.01	0.02	0.01	T.	0.01	0.06	0.55	0.33	0.73	0.23	0.20	0.17	0.23	0.21	0.17	0.15	0.11	0.14	0.12	0.12	0.06	0.06	0.03	0.02	3.74
New York, N. Y.	0.00	0.00	0.00	0.29	0.30	0.04	T.	0.04	0.11	0.03	0.03	T.	T.	T.	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
Norfolk, Va.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.04	0.03	0.03	T.	0.00	0.00	0.00	T.	T.	0.01	T.	0.00	0.00	0.00	0.00	0.11
Omaha, Neb.	T.	0.01	0.03	0.00	0.34	0.49	0.32	0.24	0.18	0.20	0.24	0.29	0.12	0.05	0.05	0.08	0.07	0.07	0.07	0.06	0.02	0.01	0.02	0.02	3.04
Pittsburgh, Pa.	0.06	0.21	0.16	0.07	0.09	0.07	0.07	0.08	0.02	0.03	0.06	0.07	0.09	0.09	0.08	0.10	0.05	0.05	0.03	0.03	0.06	0.08	0.06	0.13	1.85
Portland, Me.	0.05	0.07	0.05	0.03	0.03	0.03	0.03	0.01	0.05	0.14	0.08	0.17	0.16	0.27	0.20	0.02	0.04	0.04	0.12	0.13	0.08	0.11	0.09	0.05	2.05
Portland, Ore.	0.18	0.16	0.13	0.12	0.11	0.08	0.13	0.13	0.17	0.19	0.13	0.04	0.02	0.03	0.04	0.05	0.04	0.06	0.13	0.12	0.17	0.18	0.16	0.16	2.76
Rochester, N. Y.	0.07	0.04	0.01	0.08	0.04	0.04	0.03	T.	0.01	0.04	0.01	0.01	T.	0.03	T.	0.05	0.01	0.00	0.00	0.00	T.	0.02	0.01	0.02	0.47
St. Louis, Mo.	T.	T.	T.	0.01	0.00	0.00	0.00	T.	T.	0.14	0.08	0.02	0.01	T.	T.	T.	0.03	0.05	0.03	T.	T.	T.	0.00	T.	0.37
St. Paul, Minn.	0.08	0.07	0.04	0.05	0.05	0.03	0.01	T.	0.01	0.03	0.09	0.03	T.	T.	T.	T.	T.	T.	0.00	0.01	0.03	0.02	T.	0.06	0.62
Salt Lake City, Utah.	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Diego, Cal.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Francisco, Cal.	0.00	0.00	0.00	0.00	0.00	0.02	0.38	0.15	0.05	0.13	0.08	0.05	0.02	0.01	T.	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
Savannah, Ga.	0.03	0.06	0.49	0.05	0.03	0.03	0.00	0.00	0.01	T.	T.	0.01	0.03	0.32	0.31	0.07	0.18	0.49	0.46	0.08	0.47	0.24	0.30	0.10	3.78
Seattle, Wash.	0.32	0.18	0.24	0.34	0.30	0.32	0.16	0.21	0.23	0.15	0.15	0.35	0.41	0.14	0.18	0.15	0.24	0.33	0.16	0.14	0.10	0.13	0.13	0.28	5.73
Vicksburg, Miss.	0.00	0.00	0.00	0.04	0.16	0.05	0.02	0.07	0.02	0.03	0.00	0.00	T.	0.40	1.32	0.06	0.01	T.	0.00	T.	0.01	0.00	0.04	0.13	2.30
Washington, D. C.	0.02	0.06	0.12	0.39	0.02	0.07	0.26	0.18	0.09	0.04	0.01	T.	T.	0.01	T.	T.	0.07	0.05	T.	0.01	0.01	0.03	0.01	0.01	1.46
Wilmington, N. C.	0.08	0.10	0.25	0.20	0.01	0.02	0.03	0.04	0.02	0.16	0.20	0.03	0.05	0.07	0.02	0.01	0.02	0.01	0.04	0.02	0.01	0.04	0.46	0.07	1.97

TABLE V.—Mean temperature for each hour of seventy-fifth meridian time, November, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.....	50.8	49.6	48.6	47.7	47.1	46.3	45.9	45.3	45.7	50.2	54.3	57.7	60.7	63.3	65.6	66.7	67.0	66.0	62.8	59.0	56.9	54.3	52.8	51.8	54.8
Albany, N. Y.....	35.2	35.1	35.1	34.9	34.9	34.9	34.7	34.8	35.5	36.6	38.3	39.1	39.7	40.3	40.3	39.6	38.7	37.8	37.0	35.2	35.8	35.0	35.2	34.0	39.7
Alpena, Mich.....	29.6	29.6	29.5	29.9	29.8	29.7	29.5	29.4	29.9	30.5	31.3	32.2	32.9	33.6	33.5	33.3	33.0	32.6	32.1	31.4	31.0	30.7	30.4	29.9	31.0
Amarillo, Tex.....	43.4	41.8	40.7	39.7	38.5	37.7	37.0	36.0	36.2	39.5	43.5	48.4	52.7	56.0	58.4	59.7	59.9	59.4	56.2	52.6	50.1	48.1	46.7	44.7	47.0
Atlanta, Ga.....	46.1	45.4	44.7	43.9	43.6	43.3	42.9	42.8	44.3	47.0	49.9	52.6	54.8	56.3	57.3	57.6	56.3	54.2	52.2	50.8	49.7	48.5	47.6	46.6	49.1
Augusta, Ga.....	47.6	46.6	46.0	45.4	44.7	44.3	44.0	45.9	47.6	51.5	55.0	58.0	59.7	61.4	62.3	62.3	61.3	59.0	56.4	54.0	52.1	50.7	49.8	48.5	52.2
Baker City, Ore.....	35.2	35.1	35.1	34.9	34.9	34.9	34.7	34.8	35.5	36.6	38.3	39.1	39.7	40.3	40.3	39.6	38.7	37.8	37.0	35.2	35.8	35.0	35.2	34.0	39.7
Baltimore, Md.....	41.8	41.4	40.8	40.3	40.0	39.6	39.3	40.0	41.2	43.1	44.8	45.9	47.0	47.6	47.7	47.3	46.3	45.2	44.6	43.6	42.9	42.5	42.1	41.7	43.2
Bismarck, N. Dak.....	24.8	24.8	24.6	24.5	24.7	24.3	23.9	23.0	22.3	23.0	25.3	27.5	29.9	32.1	34.1	35.2	35.1	33.3	30.9	28.6	27.2	26.1	25.5	24.7	27.3
Boston, Mass.....	36.3	36.0	36.0	35.6	35.7	35.6	35.7	36.7	37.9	39.1	40.4	41.4	41.9	42.3	42.0	41.5	40.8	40.0	39.0	38.4	38.0	37.1	36.5	35.8	38.3
Buffalo, N. Y.....	36.2	35.8	35.4	35.2	34.7	34.6	34.4	34.7	34.9	35.9	36.7	37.7	38.3	38.8	38.8	39.0	38.4	37.9	37.6	37.2	37.0	36.7	36.4	36.2	36.6
Charleston, S. C.....	54.2	53.9	53.2	52.9	52.1	51.6	51.5	52.1	51.0	56.6	59.1	61.1	62.7	63.6	63.7	62.9	61.5	59.3	56.3	53.8	52.9	52.3	51.7	51.0	54.0
Charlotte, N. C.....	44.9	44.1	43.4	42.8	42.3	42.1	41.4	42.3	44.3	47.2	49.4	51.8	53.6	55.3	55.9	55.5	54.1	52.0	50.5	49.2	48.3	47.0	46.1	45.2	47.9
Cheyenne, Wyo.....	36.3	36.8	37.6	38.4	37.5	37.3	36.5	35.7	35.3	39.1	43.8	48.8	50.1	50.5	49.6	49.0	47.3	43.7	41.8	40.4	38.8	38.0	36.6	34.1	41.5
Chicago, Ill.....	34.2	33.4	33.2	32.9	32.7	32.5	32.3	32.4	32.8	33.4	34.5	35.7	36.9	37.4	38.0	38.1	37.7	37.1	36.7	36.5	36.0	35.6	34.9	34.3	35.0
Cincinnati, Ohio.....	39.0	38.8	38.2	37.8	37.4	36.9	36.6	36.4	37.1	38.5	40.6	42.6	43.7	44.9	46.0	46.6	46.6	46.0	44.8	43.6	42.1	41.2	40.3	39.8	41.1
Cleveland, Ohio.....	36.5	35.9	35.3	35.2	35.0	35.1	35.0	35.0	35.7	38.5	40.6	42.6	43.7	45.0	46.0	46.6	46.6	46.0	44.8	43.6	42.1	41.2	40.3	39.8	41.1
Columbus, Ohio.....	36.2	35.6	35.5	35.0	34.7	34.4	34.3	34.7	35.9	37.7	39.8	41.4	42.7	43.5	44.0	43.8	42.6	41.5	41.0	39.8	38.9	37.8	37.1	36.5	38.5
Denver, Colo.....	40.3	40.0	38.2	37.7	37.4	37.7	37.3	36.7	36.7	39.1	43.1	48.4	52.0	54.4	56.4	56.2	54.9	52.4	49.5	47.0	44.2	42.3	41.2	40.0	45.0
Des Moines, Iowa.....	32.0	31.3	31.1	30.8	30.6	29.9	29.3	29.7	30.7	32.2	34.3	36.0	38.3	39.9	40.8	41.4	40.4	38.9	37.5	36.2	34.8	33.9	33.3	32.5	34.4
Detroit, Mich.....	33.9	33.7	33.2	32.8	32.5	32.2	31.9	31.9	32.6	33.9	35.1	36.0	37.0	37.5	37.9	37.9	37.4	37.1	36.7	36.1	35.4	34.9	34.3	34.1	34.8
Dodge City, Kans.....	38.1	37.0	35.5	34.7	34.0	33.4	33.0	32.5	32.7	30.4	42.5	47.2	51.1	54.0	56.3	57.0	56.5	54.8	49.8	45.8	43.8	42.3	40.6	39.2	42.8
Duluth, Minn.....	26.1	25.8	25.4	25.0	24.7	24.4	24.0	23.5	23.5	23.7	24.7	26.1	27.3	28.1	28.7	29.1	28.8	28.5	28.0	27.4	27.1	26.8	26.5	26.1	26.2
Eastport, Me.....	34.2	33.7	33.5	33.2	32.7	32.2	31.3	30.4	30.3	35.8	36.5	37.0	37.6	37.8	37.4	37.1	36.4	36.0	35.7	35.0	34.6	34.2	33.9	33.6	35.1
El Paso, Tex.....	47.7	46.2	43.7	42.9	41.9	40.4	39.2	38.0	37.6	42.0	49.1	55.3	60.0	64.0	66.7	68.7	70.0	70.1	67.5	66.1	64.7	63.1	61.4	59.7	52.7
Fort Smith, Ark.....	46.3	45.1	44.0	43.2	42.2	41.2	40.5	40.4	41.5	45.4	49.7	53.8	57.2	59.4	61.0	61.6	61.2	59.0	56.5	54.2	52.2	50.5	49.3	47.9	50.1
Galveston, Tex.....	62.9	62.7	62.2	61.8	61.5	60.9	60.7	60.7	61.0	62.1	63.5	64.7	65.8	66.6	66.5	66.7	66.3	65.9	65.2	64.7	64.2	63.9	63.3	62.9	63.6
Grand Haven, Mich.....	35.0	34.6	34.5	34.3	33.5	33.2	33.1	33.1	33.2	33.7	34.3	35.1	35.9	36.6	36.5	36.3	36.6	36.4	35.8	35.7	35.7	35.2	35.0	34.8	34.9
Havre, Mont.....	30.7	30.3	29.1	28.7	29.1	29.2	28.6	27.9	27.9	28.4	30.3	32.8	36.1	38.5	39.9	40.3	40.6	40.4	37.5	35.3	33.9	33.2	32.5	32.0	33.1
Helena, Mont.....	40.3	39.9	39.7	38.9	38.6	38.2	37.7	37.3	36.8	36.5	37.5	39.3	41.8	43.2	44.7	46.2	46.9	46.4	45.2	44.0	43.2	42.2	41.5	40.5	41.1
Huron, S. Dak.....	26.3	25.8	25.4	25.0	24.0	24.0	24.3	24.5	27.0	29.5	31.9	34.3	35.8	37.2	37.9	37.4	35.3	32.8	30.7	29.2	28.6	27.9	27.0	26.4	29.4
Indianapolis, Ind.....	37.1	36.3	35.9	35.3	34.7	34.3	33.7	33.9	34.9	36.9	39.0	41.5	43.8	45.4	47.3	48.4	48.0	46.4	44.0	42.5	41.4	40.7	40.1	39.2	38.6
Jacksonville, Fla.....	57.1	56.6	56.2	55.9	55.2	54.9	54.9	55.7	58.5	61.4	63.7	65.3	66.6	67.3	67.4	67.0	65.8	63.6	62.1	61.1	60.0	59.2	58.3	57.6	59.5
Kansas City, Mo.....	40.2	39.3	38.7	38.2	37.6	36.9	36.3	35.2	35.3	36.7	39.8	42.6	44.7	46.4	47.0	46.9	46.0	45.1	44.6	43.9	43.0	42.1	41.8	40.8	41.8
Key West, Fla.....	72.5	72.5	72.3	72.3	71.9	71.7	71.7	72.6	73.8	74.6	75.2	75.7	75.6	75.8	75.9	75.8	75.1	74.1	73.9	73.6	73.5	73.3	73.0	72.8	73.7
Knoxville, Tenn.....	43.0	42.4	41.2	40.2	39.3	38.5	38.0	38.1	39.2	41.2	43.7	46.3	48.2	49.9	51.3	51.8	51.6	50.7	49.3	48.1	46.6	45.9	44.9	43.9	44.7
Lander, Wyo.....	28.5	28.2	27.6	27.8	26.9	26.3	26.3	27.0	25.5	27.6	34.3	39.8	43.8	48.0	49.4	51.4	51.0	49.4	43.1	38.3	34.6	31.5	30.3	28.5	30.2
Little Rock, Ark.....	46.3	45.4	44.7	43.9	43.0	42.6	42.1	42.0	43.5	46.3	49.7	53.0	56.1	57.9	59.5	60.4	60.0	58.2	56.0	53.8	52.2	50.7	49.3	47.9	50.2
Louisville, Ky.....	40.3	39.6	38.8	38.2	37.6	37.2	36.7	37.1	38.0	40.3	43.0	46.2	48.4	50.1	51.0	50.7	49.9	48.7	47.1	45.6	44.0	43.1	42.1	41.4	43.1
Lynchburg, Va.....	42.8	42.3	41.5	40.8	39.8	39.7	39.5	40.1	41.7	44.6	47.8	50.0	51.7	52.7	53.2	53.2	51.9	50.3	48.7	46.7	45.7	44.9	43.8	43.2	45.7
Marquette, Mich.....	27.4	27.2	27.1	26.8	26.8	26.9	26.9	27.2	27.4	28.0	29.0	30.0	30.5	30.6	30.7	30.7	30.2	29.3	28.8	28.4	27.8	27.5	27.3	27.1	28.3
Memphis, Tenn.....	47.6	46.6	45.7	45.1	44.3	43.8	43.4	42.9	44.3	46.9	50.0	52.7	54.9	57.3	58.2	58.6	58.1	56.8	54.9	53.4	52.2	51.0	49.9	48.8	52.9
Milwaukee, Wis.....	31.9	31.6	31.4	31.1	30.7	30.6	30.4	30.2	30.3	31.5	32.8	34.0	34.9	35.7	35.9	35.9	35.3	34.6	34.2	33.8	33.3	32.8	32.6	32.0	32.8
Montgomery, Ala.....	50.0	49.0	47.8	47.4	46.6	46.0	45.8	46.1	48.2	51.1	55.1	58.6	61.1	62.9	63.9	63.4	61.5	59.9	57.5	55.0	53.9	52.4	51.3	50.4	53.1
Moorhead, Minn.....	21.2	20.5	20.0	19.7	19.4	19.2	19.5	19.7	20.5	21.7	23.4	25.3	26.5	27.5	28.2	28.8	28.4	27.1	25.9	24.9	23.9	23.2	22.5	21.8	23.3
Nantucket, Mass.....	41.8	41.5	41.2	41.0	40.7	40.7	41.1	42.3	42.8	43.6	43.9	44.1	44.0	44.0	43.6	43.1	42.5	42.2	42.1	42.3	41.9	41.6	41.6	41.6	42.3
Nashville, Tenn.....	43.4	42.4	41.4	40.8	39.8	39.1	38.4	38.2	40.2	43.0	46.8	49.8	52.2	53.5	54.6	54.8	54.2	53.1	51.6	50.5	48.8	47.9	46.1	44.7	46.5
New Haven, Conn.....	37.0	36.6	36.4	36.0	35.6	35.0	35.0	36.0	37.3	38.8	39.9	41.0	41.9	42.1	41.9	41.6	40.4	39.6	38.8	38.0	37.6	37.2	36.8	36.3	38.2
New Orleans, La.....	57.7	57.0	56.5	56.2	55.7	55.3	54.9	54.9	56.1	59.2	61.6	63.8	65.3	65.9	66.5	66.8	66.2	64.8	62.6	61.7	60.2	59.3	58.1	57.7	60.2
New York, N. Y.....	40.0	39.6	39.1	39.0	38.8	38.1	38.3	38.8	39.9	40.6	41.9	42.9	44.2	44.2	44.9	44.7	43.8	43.1	42.6	42.0					

TABLE VI.—Mean pressure for each hour of seventy-fifth meridian time, November, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex	28.351	.354	.353	.357	.361	.366	.379	.391	.398	.405	.404	.400	.378	.348	.329	.316	.312	.313	.319	.327	.338	.350	.359	.364	.357
Albany, N. Y.	29.903	.904	.901	.902	.903	.908	.978	.987	.987	.980	.980	.966	.953	.946	.948	.953	.964	.971	.978	.984	.985	.987	.985	.983	.971
Alpena, Mich	29.323	.325	.328	.328	.330	.336	.343	.350	.354	.350	.341	.328	.308	.300	.298	.303	.308	.317	.326	.336	.334	.338	.337	.343	.328
Atlanta, Ga	29.004	.005	.007	.009	.014	.024	.037	.052	.064	.068	.069	.056	.031	.010	.008	.002	.004	.009	.010	.010	.011	.016	.017	.021	
Augusta, Ga	30.017	.014	.014	.016	.017	.024	.035	.044	.053	.057	.054	.040	.011	.004	.003	.002	.004	.009	.009	.009	.009	.017	.026	.031	.019
Baltimore, Md	29.915	.910	.909	.909	.916	.921	.935	.942	.946	.944	.931	.911	.894	.886	.888	.893	.902	.914	.925	.932	.938	.940	.937	.934	.920
Bismarck, N. Dak ..	28.247	.246	.244	.246	.243	.241	.247	.254	.260	.274	.275	.276	.261	.246	.234	.228	.241	.246	.249	.250	.255	.257	.258	.250	
Boston, Mass	29.889	.889	.886	.886	.889	.890	.912	.923	.922	.917	.904	.890	.881	.878	.870	.888	.897	.904	.910	.909	.913	.913	.913	.911	.901
Buffalo, N. Y.	29.264	.264	.266	.265	.268	.272	.280	.290	.293	.296	.301	.289	.277	.273	.274	.280	.282	.287	.289	.290	.290	.288	.283	.281	.281
Charleston, S. C.	30.161	.159	.159	.159	.159	.164	.180	.198	.205	.210	.208	.193	.171	.151	.141	.139	.144	.154	.162	.174	.177	.180	.181	.180	.172
Chicago, Ill	29.169	.165	.172	.166	.161	.163	.164	.170	.177	.184	.185	.179	.160	.146	.147	.153	.155	.165	.174	.177	.174	.176	.180	.181	.168
Cincinnati, Ohio ...	29.458	.457	.458	.456	.459	.463	.471	.480	.491	.491	.491	.470	.456	.444	.435	.434	.437	.445	.455	.460	.465	.469	.468	.462	.450
Cleveland, Ohio ...	29.251	.255	.250	.258	.262	.266	.268	.273	.281	.283	.276	.266	.249	.237	.232	.236	.238	.246	.255	.260	.258	.257	.261	.263	.258
Columbus, Ohio	29.237	.238	.240	.240	.242	.247	.251	.259	.267	.272	.270	.254	.236	.221	.216	.217	.218	.226	.230	.237	.240	.245	.246	.246	.242
Denver, Colo	24.851	.846	.846	.844	.838	.834	.835	.836	.842	.852	.861	.866	.859	.843	.825	.816	.816	.824	.839	.849	.859	.865	.869	.868	.845
Des Moines, Iowa ..	29.171	.170	.173	.173	.173	.175	.176	.184	.193	.199	.199	.197	.181	.163	.157	.155	.161	.170	.179	.189	.187	.187	.188	.187	.177
Detroit, Mich	29.244	.244	.251	.250	.253	.253	.261	.269	.276	.274	.275	.267	.251	.242	.239	.240	.247	.255	.258	.261	.262	.259	.259	.259	.250
Dodge City, Kans ...	27.517	.517	.513	.512	.506	.508	.512	.516	.529	.542	.549	.547	.528	.503	.481	.474	.471	.476	.487	.495	.508	.514	.525	.536	.511
Duluth, Minn	29.267	.265	.266	.267	.266	.290	.293	.299	.304	.302	.307	.287	.261	.243	.231	.221	.216	.229	.239	.290	.300	.301	.301	.303	.281
Eastport, Me	29.855	.850	.845	.846	.848	.858	.873	.882	.884	.879	.863	.853	.844	.843	.845	.849	.858	.863	.869	.874	.879	.880	.880	.880	.862
El Paso, Tex	26.342	.342	.341	.343	.344	.344	.351	.361	.376	.388	.392	.391	.380	.349	.323	.304	.295	.287	.298	.313	.325	.335	.344	.340	.340
Galveston, Tex	30.176	.174	.171	.169	.168	.172	.181	.195	.209	.219	.226	.218	.203	.176	.162	.153	.151	.153	.163	.172	.179	.189	.191	.188	.182
Grand Haven, Mich ..	29.333	.333	.341	.340	.333	.335	.337	.344	.354	.350	.349	.337	.322	.309	.304	.305	.311	.314	.320	.330	.338	.330	.339	.344	.331
Havre, Mont	27.577	.580	.580	.580	.573	.572	.576	.577	.580	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584	.584
Helena, Mont	25.885	.886	.888	.888	.890	.893	.891	.896	.899	.903	.916	.922	.911	.903	.885	.876	.872	.871	.872	.876	.880	.885	.890	.893	.892
Huron, S. Dak	28.678	.678	.676	.677	.672	.672	.671	.673	.672	.679	.682	.688	.675	.662	.650	.647	.650	.656	.664	.672	.670	.671	.676	.680	.670
Indianapolis, Ind ..	29.274	.272	.275	.277	.277	.281	.287	.295	.306	.311	.307	.299	.282	.270	.261	.255	.274	.284	.288	.289	.288	.287	.283	.283	.283
Jacksonville, Fla ...	30.143	.141	.137	.139	.142	.153	.166	.179	.186	.190	.183	.165	.134	.121	.113	.108	.118	.130	.143	.153	.158	.162	.161	.150	.149
Kansas City, Mo	29.128	.136	.135	.136	.123	.124	.139	.135	.152	.161	.166	.162	.138	.116	.103	.093	.097	.105	.118	.125	.129	.136	.136	.136	.127
Key West, Fla	30.108	.100	.091	.090	.093	.101	.116	.131	.142	.147	.142	.135	.104	.084	.075	.075	.081	.090	.104	.116	.123	.126	.127	.121	.109
Knoxville, Tenn ...	29.141	.143	.147	.151	.156	.164	.170	.178	.187	.195	.197	.184	.158	.139	.126	.121	.122	.128	.137	.142	.147	.151	.152	.150	.154
Little Rock, Ark	29.875	.874	.873	.875	.879	.885	.894	.905	.918	.926	.927	.917	.887	.860	.843	.832	.834	.835	.843	.856	.864	.878	.882	.876	.876
Louisville, Ky	29.579	.580	.583	.583	.585	.588	.595	.606	.615	.618	.618	.607	.583	.568	.559	.552	.555	.560	.566	.573	.581	.585	.586	.586	.584
Lynchburg, Va	29.406	.408	.409	.410	.415	.424	.435	.443	.452	.453	.446	.428	.402	.387	.374	.367	.395	.405	.416	.420	.423	.422	.419	.415	.417
Marquette, Mich	29.173	.170	.172	.167	.167	.164	.168	.173	.174	.178	.182	.179	.172	.165	.154	.141	.131	.131	.139	.147	.157	.167	.177	.194	.180
Memphis, Tenn	29.854	.858	.856	.859	.861	.871	.881	.894	.908	.914	.914	.902	.874	.846	.831	.825	.833	.826	.833	.840	.848	.857	.861	.864	.862
Milwaukee, Wis	29.297	.297	.299	.299	.308	.310	.311	.313	.318	.315	.316	.307	.290	.279	.277	.280	.281	.291	.293	.300	.298	.301	.306	.310	.301
Moorhead, Minn	29.015	.015	.016	.017	.012	.012	.011	.013	.021	.026	.033	.027	.019	.010	.009	.016	.022	.029	.039	.024	.024	.027	.028	.028	.019
Nantucket, Mass	30.022	.021	.021	.024	.029	.037	.050	.064	.062	.061	.059	.034	.018	.014	.015	.021	.026	.034	.037	.041	.040	.043	.042	.035	.035
Nashville, Tenn	29.608	.607	.608	.606	.608	.614	.623	.634	.645	.642	.640	.624	.594	.577	.569	.577	.571	.575	.589	.595	.600	.609	.612	.614	.605
New Haven, Conn ..	29.928	.934	.935	.939	.944	.949	.960	.966	.963	.960	.948	.920	.916	.906	.909	.914	.919	.928	.939	.941	.947	.948	.948	.947	.938
New Orleans, La ...	30.149	.145	.142	.144	.145	.151	.162	.173	.190	.198	.196	.182	.162	.136	.125	.121	.121	.129	.140	.152	.160	.165	.165	.165	.155
New York, N. Y.	29.884	.888	.884	.883	.888	.893	.901	.907	.907	.906	.895	.878	.867	.860	.860	.864	.874	.882	.889	.895	.901	.905	.905	.903	.888
Norfolk, Va	30.085	.083	.079	.081	.086	.092	.105	.117	.121	.123	.114	.098	.077	.062	.057	.060	.068	.081	.091	.096	.102	.106	.104	.101	.091
Omaha, Neb	28.941	.939	.939	.937	.934	.934	.935	.939	.947	.952	.955	.943	.924	.914	.915	.924	.927	.937	.944	.949	.950	.953	.953	.939	.939
Parkersburg, W. Va. ...	29.447	.447	.452	.457	.461	.467	.474	.489	.494	.497	.497	.485	.462	.446	.438	.439	.442	.445	.447	.449	.451	.454	.455	.457	.460
Philadelphia, Pa ...	29.982	.980	.978	.977	.981	.988	.997	.000	.011	.012	.000	.980	.965	.957	.960	.964	.971	.979	.988	.998	.004	.007	.003	.999	.987
Pittsburg, Pa	29.210	.215	.220	.223	.226	.231	.237	.243	.247	.246	.240	.226	.213	.201	.196	.200	.204	.210	.214	.216	.215	.217	.222	.223	.221
Portland, Oreg	30.014	.016	.020	.016	.017	.013	.010	.013	.022	.028	.039	.047	.056	.054	.040	.029	.019	.017	.017	.017	.020	.022	.020	.023	.025
Rochester, N. Y.	29.439	.440	.445	.446	.451	.453	.463	.473	.477	.481	.473	.464	.456	.451	.457	.460	.465	.471	.474	.474	.471	.466	.463	.462	.462
Roseburg, Oreg	29.587	.592	.593	.593	.595	.597	.597	.597	.597	.601	.607	.616	.624	.625	.613	.598	.586	.573	.569	.568	.570	.576	.581	.586	.593
St. Louis, Mo	29.539	.536	.537	.537	.534	.537	.541	.550	.559	.569	.575	.576	.557	.539	.526	.517	.518	.526	.537	.538	.543	.546	.546	.546	.544
St. Paul, Minn	29.145	.144	.141	.143	.139	.139	.139	.140	.144	.153	.157	.160	.140	.136	.128	.128	.132	.138	.148	.153	.157	.162	.163	.163	.145
Salt Lake City, Utah ...	25.829	.835	.836	.836	.838	.837	.837	.843	.844	.851	.863	.867	.858	.844	.826	.815	.811	.810	.810	.813	.818	.821	.826	.833	.833
San Diego, Cal	29.992	.994	.993	.988	.983	.978	.975	.974	.981	.992	.005	.014	.013</												

TABLE VII.—Average wind movement for each hour of seventy-fifth meridian time, November, 1894.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	9.0	9.6	8.8	8.6	8.9	9.3	9.0	8.8	8.8	9.7	11.8	12.6	13.1	12.9	13.0	13.0	12.9	12.3	9.4	7.8	7.5	8.1	8.3	8.9	10.1
Albany, N. Y.	8.5	8.6	7.4	7.1	6.9	7.1	7.8	8.1	9.0	9.5	9.3	9.9	10.5	10.5	10.2	9.0	7.7	7.6	7.7	7.5	7.7	7.8	8.0	7.7	8.4
Alpena, Mich.	10.2	10.4	10.7	10.5	11.6	11.3	11.4	12.1	11.5	12.0	13.8	14.6	14.6	14.4	13.9	13.0	11.7	10.7	10.2	9.7	10.4	10.6	10.7	10.0	11.7
Amarillo, Tex.	17.5	17.6	16.7	16.9	16.1	15.4	13.8	14.0	14.3	14.3	16.7	17.7	19.3	19.9	20.2	20.6	19.2	18.2	15.5	14.2	14.7	16.1	16.6	17.7	16.8
Atlanta, Ga.	9.6	10.1	10.0	9.5	10.3	10.6	10.1	10.5	10.0	10.8	11.4	11.1	11.4	11.4	11.7	11.4	10.7	9.8	9.0	9.1	9.6	10.3	10.0	9.7	10.3
Atlantic City, N. J.	11.7	12.0	12.3	12.4	12.4	12.4	11.6	12.1	13.1	14.3	14.6	14.5	13.8	13.4	14.0	13.7	12.7	11.3	10.5	10.7	11.0	11.6	12.4	12.3	12.5
Augusta, Ga.	3.0	3.1	2.7	2.5	2.6	2.7	2.2	2.6	3.0	3.9	4.5	5.5	6.5	6.2	6.4	6.3	5.7	4.5	4.0	3.4	3.2	2.9	2.3	2.7	3.8
Baker City, Oreg.	5.2	5.1	5.4	5.0	5.8	5.7	5.8	5.5	5.8	5.9	5.7	5.7	4.8	4.0	3.9	4.1	4.2	4.4	3.5	3.0	4.1	4.6	4.5	5.1	4.9
Baltimore, Md.	7.7	7.8	6.9	7.1	7.2	7.1	6.6	7.5	9.1	9.4	10.7	12.1	12.8	12.2	11.9	11.2	9.9	8.1	7.1	6.8	6.6	6.9	7.2	7.2	8.6
Bismarck, N. Dak.	8.5	9.4	9.5	9.2	9.6	11.6	11.7	11.4	11.6	12.0	13.3	13.9	14.9	16.4	16.8	16.0	14.4	12.2	9.9	9.0	8.9	8.7	8.7	8.6	11.5
Block Island, R. I.	19.6	19.7	20.2	20.6	20.4	18.9	19.5	20.0	19.5	19.6	19.1	18.6	18.4	18.6	17.9	18.0	18.4	18.6	18.9	19.4	19.6	19.0	19.8	19.4	19.2
Boston, Mass.	11.9	11.6	11.5	11.3	10.3	11.1	11.8	12.4	13.2	13.7	14.1	14.1	13.9	14.5	14.1	13.2	12.3	11.4	10.9	11.2	10.5	10.4	11.2	11.5	12.2
Buffalo, N. Y.	15.2	15.7	15.3	14.5	15.0	15.0	14.9	14.6	15.3	15.9	16.0	16.2	16.6	16.4	16.6	16.3	15.8	15.5	15.0	14.5	14.3	13.9	14.2	14.8	15.3
Cairo, Ill.	8.9	8.9	9.2	9.5	10.1	9.8	9.4	9.3	9.9	10.5	11.3	11.4	11.5	11.6	12.0	11.2	10.4	9.6	8.2	8.5	9.2	9.8	9.3	9.5	10.0
Cape Henry, Va.	12.4	13.8	13.8	13.3	13.5	12.6	12.5	13.0	14.2	14.2	13.6	12.8	12.1	12.7	11.9	11.0	10.7	10.7	10.3	11.3	12.1	12.4	12.8	12.8	12.5
Charleston, S. C.	6.5	6.1	5.9	6.5	6.3	6.3	6.3	6.5	6.8	7.1	7.1	7.5	8.3	8.1	8.3	8.6	7.6	6.1	5.6	6.0	6.4	6.3	6.2	6.1	6.7
Charlotte, N. C.	6.0	5.9	6.0	6.5	6.0	5.6	5.4	6.9	5.4	6.4	7.5	8.1	8.8	9.8	10.2	10.0	8.7	6.6	6.6	6.6	6.4	6.4	6.1	5.7	6.9
Chattanooga, Tenn.	5.9	5.6	5.7	6.1	6.3	6.7	5.7	5.7	6.5	7.0	7.4	8.1	8.8	9.5	9.7	10.5	10.9	9.4	7.9	7.0	6.5	6.9	6.0	6.0	7.3
Cheyenne, Wyo.	11.0	10.9	11.8	12.6	12.7	12.9	13.5	11.8	11.7	13.5	11.7	12.4	17.2	17.3	18.9	18.8	16.4	13.6	11.6	11.2	11.3	12.1	12.0	13.7	13.7
Chicago, Ill.	16.0	16.9	16.8	17.9	18.6	18.6	18.9	18.3	18.8	18.5	18.0	17.2	17.8	17.0	16.8	16.7	16.6	16.7	16.4	15.6	16.2	16.8	16.4	16.0	17.2
Cincinnati, Ohio.	7.2	7.6	7.7	7.4	7.4	7.5	7.7	7.8	8.7	9.7	10.5	11.1	11.3	10.8	10.2	9.7	9.0	9.1	9.1	9.2	8.2	7.7	7.5	8.9	8.9
Cleveland, Ohio.	16.7	17.3	16.3	17.3	17.0	17.3	18.0	18.2	18.3	18.9	19.4	19.5	19.6	20.1	20.0	19.6	18.1	17.3	17.4	17.0	17.3	17.0	16.5	16.5	18.0
Columbia, Mo.	7.1	7.1	7.3	7.5	8.2	7.9	7.8	7.6	7.3	8.8	9.8	10.2	10.5	10.5	10.6	11.0	10.6	8.9	7.7	7.4	7.8	7.4	7.7	6.9	8.5
Columbus, Ohio.	6.6	6.9	6.8	6.9	7.3	7.3	7.5	7.6	8.2	9.3	10.0	10.6	10.4	10.7	10.7	10.6	8.4	7.3	6.8	6.8	7.0	6.8	6.8	6.8	8.0
Concordia, Kans.	6.2	6.2	6.2	6.1	6.4	5.9	6.0	5.3	6.0	7.7	9.3	10.2	11.1	11.6	11.3	11.6	11.3	9.4	7.6	7.4	7.0	6.8	7.3	6.9	8.0
Corpus Christi, Tex.	9.3	8.9	8.2	8.4	8.1	7.9	7.9	7.7	7.6	8.6	9.6	10.0	10.9	11.6	12.8	13.8	13.2	12.7	11.6	11.1	10.3	10.0	10.3	10.3	10.0
Davenport, Iowa.	10.3	10.0	10.4	10.2	9.9	9.7	10.0	10.2	10.6	11.1	11.4	11.7	12.7	12.6	12.8	13.0	12.6	10.6	10.0	10.1	11.3	10.4	10.2	10.6	10.9
Denver, Colo.	5.7	6.5	7.5	6.4	6.6	7.2	7.1	8.1	7.7	8.1	8.2	7.7	7.3	8.9	8.3	8.9	9.8	9.7	8.5	6.5	6.8	7.5	7.2	7.8	7.8
Des Moines, Iowa.	8.7	9.3	8.8	8.8	8.4	8.6	8.5	8.2	8.1	8.7	10.1	10.3	10.4	11.6	12.0	11.4	11.9	10.5	9.0	9.1	9.7	9.3	9.5	9.6	9.6
Detroit, Mich.	12.3	12.1	11.9	11.8	11.8	12.1	12.0	12.1	13.0	14.1	14.5	14.8	15.6	15.8	15.2	14.7	14.2	13.1	12.7	12.9	12.9	12.5	12.0	12.3	13.2
Dodge City, Kans.	8.0	8.1	7.8	7.7	7.2	8.1	8.3	8.5	9.4	10.0	13.0	14.3	14.5	14.9	15.2	14.8	14.2	12.7	9.4	8.3	8.8	8.6	8.5	7.6	10.3
Duluth, Minn.	7.7	7.5	7.3	6.8	6.2	6.7	6.0	6.2	6.7	7.2	7.2	7.6	7.8	7.7	7.5	6.9	6.9	6.7	7.2	7.6	6.9	7.4	7.2	7.0	7.0
Eastport, Me.	12.7	11.9	12.7	12.6	12.2	13.0	13.9	13.9	16.1	16.8	16.9	16.1	15.5	14.8	15.0	14.2	13.8	14.0	14.6	14.1	13.8	13.2	12.2	12.6	14.0
El Paso, Tex.	6.8	7.3	6.6	6.4	6.4	7.3	7.1	6.9	7.0	6.5	6.6	8.1	9.2	9.0	9.8	10.1	10.5	10.5	9.1	7.2	6.8	7.2	7.1	7.1	7.8
Erie, Pa.	14.5	14.3	13.7	14.2	14.7	14.5	15.5	15.5	15.5	15.5	16.0	15.8	16.1	15.9	15.6	14.4	14.7	14.3	15.1	14.8	14.4	14.8	15.0	14.2	15.0
Eureka, Cal.	3.2	3.0	3.0	3.1	3.1	3.2	2.8	3.5	3.1	3.5	3.5	3.1	3.4	4.0	4.8	5.6	7.1	6.9	6.0	5.4	4.1	3.5	3.4	3.2	4.0
Fort Canby, Wash.	12.1	11.3	12.1	12.2	12.6	11.7	12.5	13.7	14.0	13.7	13.0	13.5	14.1	13.2	14.2	14.2	13.0	13.3	13.3	12.1	12.5	11.2	11.5	11.4	12.8
Fort Smith, Ark.	5.9	6.2	6.7	6.5	6.8	6.7	6.6	6.8	6.7	7.0	7.6	7.7	8.8	8.9	9.6	9.2	9.2	8.2	6.4	6.0	6.6	7.1	6.8	7.3	7.3
Fresno, Cal.	4.6	3.9	3.5	3.6	3.8	3.7	3.2	3.6	3.5	3.5	3.2	2.8	3.0	2.9	3.2	3.5	3.5	3.3	2.9	3.4	4.0	4.3	4.5	3.5	3.5
Galveston, Tex.	10.6	10.7	10.3	10.2	9.9	10.1	10.1	10.8	11.0	10.8	11.2	11.2	11.6	10.9	10.5	10.4	9.8	9.2	8.5	8.9	9.7	9.8	10.0	10.2	10.2
Grand Haven, Mich.	13.2	13.7	13.8	14.0	13.6	13.9	13.4	13.3	13.5	13.9	14.1	13.6	12.5	12.1	11.9	11.7	11.6	11.4	11.4	11.0	11.6	13.0	12.7	12.7	12.7
Green Bay, Wis.	9.2	8.9	9.4	9.5	9.6	9.7	9.2	9.3	10.0	10.8	11.0	11.1	10.4	10.4	10.9	9.5	9.0	8.9	8.1	8.8	9.4	9.2	9.0	9.6	9.6
Hannibal, Mo.	9.4	10.0	9.5	9.5	10.0	10.4	10.8	11.0	10.6	11.0	11.9	11.7	12.3	13.0	12.3	13.2	12.2	10.5	9.2	9.4	9.4	9.1	9.7	10.6	10.6
Harrisburg, Pa.	7.1	7.1	6.8	6.8	6.5	6.8	7.1	6.6	7.1	8.9	9.8	10.5	10.5	11.4	10.9	10.2	9.1	8.8	8.9	8.3	8.8	7.7	7.2	8.4	8.4
Hatteras, N. C.	14.4	14.1	13.6	13.6	14.5	14.7	14.5	14.4	14.1	13.7	14.1	14.2	14.3	14.1	13.7	14.6	13.4	12.9	13.3	13.7	13.8	13.4	13.6	13.9	13.9
Havre, Mont.	10.2	8.9	9.1	9.1	9.9	9.4	9.1	8.8	9.0	9.7	9.9	11.7	12.7	13.7	13.5	13.1	13.1	12.1	11.6	10.3	9.8	10.7	10.6	10.6	10.6
Helena, Mont.	9.2	9.1	9.1	8.2	6.6	7.7	7.6	7.1	7.2	6.8	6.1	6.3	6.9	8.0	8.5	9.8	8.5	9.3	10.4	11.3	10.7	10.7	10.0	10.0	8.5
Huron, S. Dak.	12.4	12.5	12.4	12.0	12.9	12.2	12.1	13.9	14.5	16.0	18.2	19.9	20.6	21.0	20.5	19.9	18.2	15.7	13.7	13.4	13.3	13.2	13.6	13.0	15.2
Idaho Falls, Idaho.	7.0	6.7	7.3	7.0	6.8	6.7	6.9	6.7	6.5	6.5	6.6	6.8	6.7	8.4	10.1	10.3	9.8	9.2	8.0	7.8	7.9	7.7	7.6	7.6	7.6
Indianapolis, Ind.	7.1	7.1	6.9	6.9	7.4	7.6	7.8	8.2	8.4	9.4	9.5	9.5	9.7	9.6	9.9	9.6	9.1	7.9	7.5	7.2	7.1	7.2	7.2	7.3	8.1
Jacksonville, Fla.	4.4	4.5	4.8	4.6	4.8	5.5	5.0	4.9	5.5	5.6	5.9	6.8	6.9	6.3	6.8	6.9	6.6	5.1	4.6	4.3	4.4	4.0	4.0	4.0	5.3
Jupiter, Fla.	8.7	9.0	9.2	9.1	9.1	9.3	9.7	9.8	10.3	11.1	12.6	12.8	12.9	12.3	12.6	12.3	11.3	10.0	10.6	10.5	10.3	9.7	9.8	10.5	10.5
Kansas City, Mo.	9.6	9.5	9.3	9.6	9.2	9.2	9.4	9.4	9.6	9.6	10.2	10.4	11.4	11.0	11.3	11.8	11.6	10.							

TABLE VII.—Average wind movement, etc.—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Parkersburg, W. Va.	6.7	5.5	5.4	5.4	5.4	5.1	5.9	6.7	6.3	7.7	8.8	9.5	9.6	10.2	9.9	8.9	7.6	6.4	5.9	5.6	5.5	5.8	6.0	6.3	6.9
Pensacola, Fla.	7.6	8.1	8.5	8.6	8.2	8.2	8.1	8.5	8.6	9.2	9.9	9.5	8.6	9.5	9.9	9.9	9.5	7.3	6.2	6.6	7.9	7.5	8.0	7.8	8.4
Philadelphia, Pa.	10.2	10.2	10.6	10.1	9.8	9.5	9.4	9.9	11.0	11.6	12.5	12.1	12.5	12.4	12.4	11.8	10.7	10.3	9.8	10.0	10.5	10.2	10.1	9.9	10.7
Pierre, S. Dak.	6.7	6.9	7.3	8.3	8.7	9.2	9.0	9.4	9.4	9.6	10.4	11.9	12.2	12.2	12.6	13.0	12.0	11.2	8.8	6.7	6.2	6.8	7.2	7.0	9.3
Pittsburg, Pa.	7.0	6.7	6.8	7.2	6.8	6.6	6.6	7.5	7.8	8.6	9.3	9.5	9.7	9.8	9.5	9.3	8.7	7.8	7.6	7.7	7.6	7.7	7.6	7.5	8.0
Port Angeles, Wash.	4.5	4.2	4.4	4.4	4.1	3.5	4.1	3.8	4.0	4.1	4.4	4.2	4.5	5.0	5.6	6.0	5.5	5.5	5.0	4.2	4.3	4.7	4.5	4.3	4.5
Port Huron, Mich.	13.0	13.8	12.5	11.8	12.5	12.8	13.5	13.3	13.7	15.4	16.2	16.5	17.2	17.6	17.6	16.3	14.2	13.1	13.9	12.8	12.5	13.3	12.9	12.4	14.0
Portland, Me.	8.4	7.8	8.1	7.6	7.5	7.7	7.9	7.9	8.5	9.7	10.5	10.6	10.9	10.4	10.5	9.1	8.5	8.7	8.2	8.1	8.3	7.9	8.2	8.6	8.7
Portland, Oreg.	7.1	9.2	9.3	8.7	8.3	8.0	8.3	8.7	8.5	8.0	8.2	7.7	8.4	7.7	7.4	8.4	8.5	9.0	8.1	7.6	6.7	5.7	6.2	6.8	7.9
Pueblo, Colo.	5.3	5.0	5.0	5.1	4.8	5.4	5.1	5.0	4.8	4.7	4.6	6.4	8.6	10.0	10.0	10.7	9.8	9.8	8.9	8.2	6.6	5.7	5.1	5.0	6.6
Raleigh, N. C.	5.4	5.2	5.4	5.7	5.2	5.4	5.8	6.1	6.7	8.3	8.7	8.3	8.9	8.7	8.8	8.2	6.3	4.9	4.6	5.4	5.7	5.5	5.0	5.2	6.4
Rapid City, S. Dak.	8.4	8.5	8.9	8.9	9.1	9.9	10.3	10.4	9.7	9.2	9.2	10.7	12.3	13.2	13.2	13.6	12.7	10.8	8.8	8.0	8.5	8.5	8.9	8.7	10.0
Red Bluff, Cal.	5.6	5.7	5.9	5.7	5.5	5.1	5.6	5.0	4.8	4.9	4.9	5.3	5.9	6.7	6.9	6.5	6.3	6.1	5.3	4.4	5.2	5.3	5.6	5.6	5.6
Rochester, N. Y.	8.4	8.4	8.3	8.0	8.0	8.6	9.3	8.8	9.4	10.4	10.7	11.6	12.4	12.2	10.9	10.0	9.9	8.9	8.7	8.6	8.4	8.2	7.9	9.2	9.3
Roseburg, Oreg.	1.1	1.0	0.8	1.2	1.5	1.1	1.3	1.8	2.1	1.8	1.5	1.7	1.5	2.5	2.8	3.3	3.8	3.9	3.3	2.5	1.7	1.7	1.3	1.3	1.9
Sacramento, Cal.	6.3	6.9	7.4	6.9	6.6	5.5	5.5	5.8	5.9	5.1	4.3	3.7	3.9	4.4	4.6	4.9	5.2	5.2	4.6	4.1	4.4	5.0	5.4	5.8	5.3
St. Louis, Mo.	13.4	13.3	13.3	12.7	13.6	13.2	12.5	12.6	13.6	13.9	13.4	13.6	13.9	13.4	13.6	13.9	14.0	13.4	13.0	13.0	13.5	13.3	13.6	13.3	13.3
St. Paul, Minn.	9.4	9.0	8.5	8.3	7.7	7.4	7.3	7.1	7.2	7.7	8.5	10.0	10.4	10.7	11.4	11.6	11.0	10.5	10.3	10.1	10.0	10.1	9.3	9.2	9.3
St. Vincent, Minn.	9.8	9.6	9.6	9.3	9.4	8.8	8.7	9.8	10.0	10.5	11.5	12.4	13.9	13.9	14.3	13.3	12.2	10.5	9.2	9.3	9.8	9.8	9.7	9.7	10.6
Salt Lake City, Utah.	3.9	3.6	4.0	3.8	3.9	4.1	4.1	4.0	4.1	3.7	3.6	3.6	3.4	4.5	6.7	7.5	7.3	6.4	5.6	4.4	3.5	3.4	3.6	3.7	4.4
San Antonio, Tex.	4.0	4.3	4.0	3.9	4.1	4.3	4.7	5.1	5.3	5.8	6.8	7.8	8.1	8.4	8.0	7.8	7.5	6.6	5.8	5.4	5.4	5.2	5.1	4.1	5.7
San Diego, Cal.	2.3	2.4	2.8	2.5	2.3	2.0	2.3	2.2	2.2	2.4	2.4	2.8	4.4	5.6	7.2	8.5	8.6	8.0	7.1	6.0	3.9	2.6	1.8	2.2	3.9
Sandusky, Ohio.	9.9	9.7	9.8	10.0	10.6	10.2	11.2	11.1	11.4	13.0	13.6	13.5	13.7	13.3	13.3	12.5	11.3	10.7	10.8	11.0	11.4	10.9	10.1	9.3	11.3
San Francisco, Cal.	5.0	4.6	4.4	4.4	4.1	4.0	3.4	3.6	3.9	3.5	3.8	4.5	4.9	5.2	5.0	5.8	7.1	8.0	8.1	8.4	7.4	6.8	6.1	5.7	5.3
San Luis Obispo, Cal.	2.9	3.3	3.5	4.1	4.1	4.5	4.9	4.3	4.0	3.8	3.9	3.8	4.7	5.3	5.7	6.4	7.5	7.3	6.4	5.3	4.1	3.8	3.2	2.5	4.6
Santa Fe, N. Mex.	4.0	4.2	3.3	3.8	5.0	4.8	5.6	5.2	5.0	5.3	6.3	7.6	9.0	9.2	9.0	8.6	8.3	8.0	6.0	4.0	4.2	4.4	4.4	4.5	5.8
Sault Ste. Marie, Mich.	9.2	9.1	9.3	9.0	8.8	9.4	9.7	10.0	10.4	11.3	12.1	13.0	12.6	12.7	12.1	12.8	11.4	10.8	9.4	9.7	9.7	9.7	9.7	9.0	10.5
Savannah, Ga.	6.7	7.1	7.2	7.2	7.3	6.7	6.7	6.6	7.1	7.3	7.5	8.5	8.7	8.9	9.1	8.6	8.2	6.4	6.6	6.4	5.9	6.4	6.9	6.8	7.3
Seattle, Wash.	4.0	4.8	4.9	4.8	4.9	5.4	5.8	6.0	5.7	5.7	5.6	5.9	6.3	5.7	5.6	6.0	6.3	6.2	6.0	5.9	6.0	5.5	5.1	5.0	5.6
Shreveport, La.	5.9	5.6	5.8	5.7	5.3	5.2	5.2	5.0	5.0	6.0	7.1	7.8	8.0	8.3	8.2	8.7	8.7	8.2	7.0	6.4	6.9	7.2	6.8	7.1	6.7
Sioux City, Iowa.	9.4	9.9	9.3	9.7	10.0	9.7	10.2	10.8	11.1	12.0	13.9	15.3	16.3	18.0	19.1	18.8	16.6	14.5	11.8	11.2	11.1	10.6	10.4	9.7	12.5
Spokane, Wash.	5.8	5.7	5.5	4.7	5.2	5.2	5.5	5.5	5.3	5.1	5.2	5.7	6.6	6.7	7.2	7.3	7.3	7.8	5.9	5.7	7.1	6.3	6.1	5.9	6.0
Springfield, Ill.	11.3	11.3	11.1	10.7	11.1	10.7	10.6	10.7	11.0	12.1	12.7	13.0	12.9	12.6	12.9	12.5	11.7	10.6	9.7	10.1	10.4	10.7	11.3	11.7	11.4
Springfield, Mo.	10.8	10.1	10.4	10.0	9.7	10.2	9.9	10.1	11.3	11.4	12.0	12.7	13.4	14.1	14.4	14.2	12.6	11.4	10.7	11.2	11.6	11.6	11.6	11.0	11.5
Tampa, Fla.	4.5	4.8	4.9	4.6	4.3	4.0	4.4	4.6	5.7	6.4	6.4	6.7	6.9	6.7	7.2	7.5	6.8	5.2	4.9	4.5	4.5	4.9	4.6	4.3	5.4
Tatoosh Island, Wash.	14.8	16.0	16.4	17.5	17.7	18.3	18.0	19.5	19.5	19.6	20.3	20.5	19.2	19.5	18.9	19.0	19.2	18.8	17.7	18.3	17.2	16.5	16.3	17.0	18.2
Titusville, Fla.	8.6	8.6	8.7	8.5	8.4	7.9	7.7	7.7	8.5	10.0	12.1	11.2	13.1	13.7	14.2	13.9	12.9	10.2	9.5	9.2	8.3	8.8	9.2	8.7	10.0
Toledo, Ohio.	10.4	10.4	10.4	10.6	10.9	10.9	10.7	10.9	12.2	14.0	15.0	14.9	15.1	14.9	15.0	13.5	13.2	12.1	12.0	11.3	11.4	10.9	10.5	10.6	12.2
Tucson, Ariz.	4.1	3.8	4.2	4.8	4.4	4.2	4.4	4.3	4.4	3.9	3.4	3.9	4.7	4.4	4.3	4.6	4.9	4.5	3.8	3.2	3.5	3.5	4.2	4.6	4.2
Valentine, Nebr.	9.3	9.9	9.4	9.6	9.3	10.3	9.7	9.8	10.4	10.2	10.7	13.2	16.5	17.7	17.3	16.5	16.1	14.9	11.9	9.9	8.5	8.3	9.5	9.4	11.6
Vicksburg, Miss.	7.0	6.3	6.2	6.4	6.1	5.6	5.7	5.9	5.9	6.4	6.5	6.8	7.4	7.7	7.4	7.8	7.1	6.1	5.0	5.2	6.2	6.7	6.5	6.4	6.4
Vineyard Haven, Mass.	11.0	10.8	10.7	10.9	10.7	11.3	11.3	11.6	12.6	13.0	13.2	13.6	13.1	12.8	11.9	11.3	11.4	11.5	11.8	11.7	11.4	11.1	10.6	11.8	11.8
Walla Walla, Wash.	4.9	4.6	4.4	4.7	5.0	5.2	5.1	4.9	4.8	5.0	5.7	4.9	6.0	7.3	6.7	6.4	6.8	6.4	6.2	5.3	5.1	5.2	5.0	4.6	5.4
Washington, D. C.	6.5	6.0	6.2	6.3	6.3	5.8	5.8	5.7	7.0	8.5	9.7	10.6	11.6	11.6	11.4	10.2	8.4	7.6	7.2	6.9	6.5	6.3	7.2	6.7	7.8
Wichita, Kans.	8.4	8.4	8.1	8.0	8.2	8.1	8.5	8.9	9.1	9.9	11.6	12.6	12.7	12.9	13.3	13.4	13.6	11.8	9.4	9.4	9.3	8.8	9.5	9.5	10.1
Williston, N. Dak.	8.7	9.2	10.0	10.3	10.1	10.0	9.7	9.2	8.5	8.4	10.3	12.1	12.8	13.6	14.9	15.3	14.2	12.1	10.0	9.7	9.2	9.1	8.8	8.6	10.6
Wilmington, N. C.	6.1	6.2	5.3	6.6	7.0	6.2	6.3	6.1	7.5	8.2	8.3	9.4	10.7	10.7	11.0	10.4	8.6	6.8	6.1	6.3	5.9	5.7	5.4	5.8	7.4
Winnemucca, Nev.	8.4	9.1	9.0	8.9	8.5	7.6	7.8	7.8	8.6	9.8	8.2	8.1	8.5	8.7	9.0	9.7	10.0	9.0	8.5	7.4	7.3	6.3	7.3	7.6	8.4
Woods Hole, Mass.	20.5	20.7	20.9	20.4	20.6	20.9	21.1	20.8	19.7	20.0	20.1	20.2	20.9	20.7	20.5	19.6	19.5	18.7	19.4	20.1	20.5	19.6	19.2	18.4	20.1
Yuma, Ariz.	3.2	3.5	3.8	3.5	3.8	4.6	4.4	5.0	4.8	5.2	5.2	5.5	6.5	6.8	7.3	6.8	6.3	5.9	5.2	4.6	4.5	4.2	3.2	2.9	4.9

TABLE VIII.—Prevailing and resultant winds from self-registers for November, 1894.

Number.	Station.	Prevailing wind.		Total movement.		Resultant direction.			Resultant movement.		Azimuth of movement minus direction.	Ratio of resultant movement to total movement.
		Direction from.	Duration.	Monthly.	Hourly average.	Direction from.	Duration.	Average hourly velocity.	Direction from.	Amount.		
	(1)	(2)	(3) Hours.	(4) Miles.	(5) Miles.	(6)	(7) Hours.	(8) Miles.	(9)	(10) Miles.	(11)	(12)
1	Eastport, Me.	w.	206	10,096	14.0	n. 76 w.	340	11.0	n. 65 w.	3,753	+ 11	0.372
2	Portland, Me.	w.	171	6,288	8.7	n. 86 w.	326	8.3	n. 83 w.	2,703	+ 3	0.430
3	Boston, Mass.	w.	264	8,761	12.2	n. 84 w.	396	12.6	n. 82 w.	4,988	+ 2	0.569
4	Nantucket, Mass.	n.	216	9,869	13.7	n. 27 w.	243	16.5	n. 13 w.	4,018	+ 14	0.407
5	New Haven, Conn.	n.	179	7,584	10.5	n. 47 w.	302	10.8	n. 55 w.	3,252	- 8	0.429
10	Albany, N. Y.	s.	196	6,033	8.4	s. 66 w.	201	9.3	s. 50 w.	1,868	- 16	0.310
11	New York, N. Y.	nw.	166	8,575	11.9	n. 84 w.	299	14.9	n. 78 w.	4,465	+ 6	0.521
13	Philadelphia, Pa.	nw.	187	7,720	10.7	n. 83 w.	240	14.4	n. 77 w.	3,467	+ 6	0.449
15	Baltimore, Md.	nw.	159	6,213	8.6	s. 80 w.	297	8.2	n. 82 w.	2,425	+ 18	0.390
16	Washington, D. C.	s.	210	5,585	7.8	s. 65 w.	222	10.2	n. 88 w.	2,272	+ 27	0.407
17	Lynchburg, Va.	sw.	193	3,536	4.9	s. 82 w.	267	6.9	n. 81 w.	1,833	+ 17	0.518
18	Norfolk, Va.	w.	160	6,598	9.2	n. 80 w.	190	12.6	s. 86 w.	2,401	+ 14	0.364
24	Wilmington, N. C.	nw.	196	5,325	7.4	n. 72 w.	261	7.9	n. 68 w.	2,074	+ 4	0.390
26	Augusta, Ga.	nw.	224	2,769	3.8	n. 56 w.	111	7.0	n. 56 w.	774	0	0.280
27	Savannah, Ga.	nw.	224	5,244	7.3	n. 73 w.	240	8.0	n. 60 w.	1,908	+ 13	0.364
28	Jacksonville, Fla.	n.	171	3,792	5.3	n. 5 w.	206	6.5	n. 15 w.	1,338	- 10	0.353
30	Key West, Fla.	ne.	323	9,065	12.6	n. 69 e.	520	13.7	n. 59 e.	7,119	- 10	0.785
33	Atlanta, Ga.	nw.	262	7,442	10.3	n. 78 w.	161	13.4	n. 68 w.	2,152	+ 10	0.289
35	Vicksburg, Miss.	se.	170	4,631	6.4	s. 84 e.	113	9.8	s. 45 e.	1,114	+ 39	0.241
39	New Orleans, La.	ne.	171	5,394	7.5	n. 59 e.	268	8.5	n. 44 e.	2,284	- 15	0.423
43	Little Rock, Ark.	sw.	124	5,072	7.0	w.	108	8.9	n. 69 w.	964	+ 21	0.190
44	Galveston, Tex.	se.	163	7,378	10.2	s. 86 e.	273	8.4	n. 83 e.	2,289	- 11	0.310
48	Knoxville, Tenn.	sw.	182	3,560	4.9	s. 82 w.	298	6.6	s. 87 w.	1,970	- 11	0.553
49	Memphis, Tenn.	nw.	195	5,691	7.9	n. 73 w.	167	7.4	s. 66 w.	1,234	- 7	0.217
50	Nashville, Tenn.	nw.	193	4,599	6.8	s. 74 w.	221	8.8	s. 60 w.	1,937	- 14	0.395
52	Louisville, Ky.	s.	200	6,532	9.1	s. 31 w.	307	10.5	s. 39 w.	3,235	+ 8	0.495
53	Indianapolis, Ind.	nw.	222	5,849	8.1	s. 63 w.	242	8.6	s. 57 w.	2,086	+ 6	0.357
54	Cincinnati, Ohio.	nw.	156	6,382	8.9	s. 43 w.	206	12.7	s. 68 w.	2,619	+ 25	0.410
55	Columbus, Ohio.	s.	155	5,786	8.0	s. 44 w.	262	9.3	s. 42 w.	2,428	+ 2	0.420
56	Pittsburg, Pa.	nw.	166	5,727	8.0	s. 72 w.	323	8.6	s. 75 w.	2,785	+ 3	0.486
58	Buffalo, N. Y.	nw.	216	11,029	15.3	n. 86 w.	262	23.8	s. 87 w.	6,246	- 7	0.566
60	Rochester, N. Y.	sw.	249	6,718	9.3	s. 57 w.	285	11.6	s. 69 w.	3,295	+ 12	0.490
62	Cleveland, Ohio.	se.	228	12,050	18.0	s. 22 w.	265	18.2	s. 38 w.	4,823	+ 16	0.372
64	Toledo, Ohio.	nw.	215	8,760	12.2	n. 88 w.	359	13.4	s. 82 w.	4,819	- 10	0.550
65	Detroit, Mich.	sw.	213	9,502	13.2	s. 87 w.	345	16.5	s. 78 w.	5,700	- 9	0.600
66	Alpena, Mich.	nw.	224	8,402	11.7	n. 85 w.	332	9.1	n. 77 w.	3,009	+ 8	0.358
67	Grand Haven, Mich.	nw.	215	9,137	12.7	n. 50 w.	106	24.8	n. 79 w.	2,625	- 29	0.287
68	Marquette, Mich.	nw.	180	8,647	12.0	w.	224	12.4	n. 81 w.	2,777	+ 9	0.321
70	Sault Ste. Marie, Mich.	se.	160	7,530	10.5	s. 60 w.	46	24.0	s. 88 w.	1,104	+ 28	0.147
71	Chicago, Ill.	nw.	210	12,401	17.2	n. 89 w.	215	18.6	s. 77 w.	4,000	- 14	0.322
72	Milwaukee, Wis.	nw.	222	8,129	11.3	s. 88 w.	295	12.9	n. 87 w.	3,800	+ 5	0.467
74	Duluth, Minn.	nw.	195	5,075	7.0	w.	292	8.0	n. 73 w.	2,347	+ 17	0.462
75	Moorhead, Minn.	nw.	223	9,200	12.8	n. 73 w.	167	10.5	s. 89 w.	1,747	- 18	0.190
77	Bismarck, N. Dak.	nw.	250	8,285	11.5	n. 45 w.	199	18.7	n. 36 w.	3,718	+ 12	0.449
79	Saint Paul, Minn.	se.	224	6,681	9.3	s. 45 w.	147	13.1	s. 86 w.	1,924	+ 41	0.288
81	Davenport, Iowa.	nw.	179	7,871	10.9	s. 85 w.	225	15.0	n. 88 w.	3,378	+ 7	0.429
82	Des Moines, Iowa.	nw.	208	6,889	9.6	n. 62 w.	219	12.3	n. 69 w.	2,693	- 7	0.391
88	Saint Louis, Mo.	nw.	190	9,604	13.3	s. 64 w.	206	16.6	s. 65 w.	3,449	+ 1	0.359
90	Kansas City, Mo.	nw.	243	7,153	9.9	n. 84 w.	77	15.3	n. 84 w.	1,176	0	0.164
92	Omaha, Nebr.	nw.	278	6,237	8.7	n. 71 w.	158	10.4	n. 70 w.	1,640	+ 1	0.263
96	Huron, S. Dak.	nw.	259	10,953	15.2	n. 89 w.	125	13.9	n. 82 w.	1,740	+ 7	0.159
98	Havre, Mont.	w.	190	7,636	10.6	n. 80 w.	299	12.6	s. 89 w.	3,758	- 11	0.492
100	Helena, Mont.	sw.	339	6,130	8.5	s. 75 w.	469	10.3	s. 64 w.	4,812	- 11	0.782
107	Denver, Colo.	s.	177	5,595	7.8	s. 23 w.	153	5.8	s. 54 w.	884	+ 31	0.158
111	Dodge City, Kans.	ne.	143	7,440	10.3	n. 13 w.	127	11.4	n. 6 w.	1,448	+ 7	0.195
114	Abilene, Tex.	sw.	214	7,256	10.1	s. 38 w.	219	10.9	s. 50 w.	2,395	+ 12	0.330
116	El Paso, Tex.	nw.	166	5,624	7.8	n. 12 e.	133	10.8	n. 12 w.	1,440	- 24	0.256
117	Santa Fe, N. Mex.	se.	196	4,187	5.8	n. 80 e.	170	6.6	n. 39 e.	1,126	- 41	0.269
119	Yuma, Ariz.	ne.	238	3,500	4.9	n. 37 e.	438	5.7	n. 21 e.	2,505	- 16	0.716
122	Salt Lake City, Utah.	se.	258	3,187	4.4	s. 13 e.	135	2.8	s. 37 w.	383	+ 50	0.120
125	Spokane, Wash.	sw.	108	4,326	6.0	s. 15 w.	208	11.5	s. 21 w.	2,387	+ 6	0.552
130	Seattle, Wash.	se.	292	3,999	5.6	s. 52 e.	214	9.6	s. 48 e.	2,055	+ 4	0.514
132	Portland, Oregon.	nw.	200	5,712	7.9	s. 40 w.	216	11.6	s. 35 w.	2,512	- 4	0.440
133	Roseburg, Oregon.	w.	98	1,400	1.9	n. 88 w.	83	3.3	w.	273	- 2	0.195
137	San Francisco, Cal.	nw.	234	3,833	5.3	n. 87 w.	316	5.7	s. 75 w.	1,789	- 18	0.467
140	San Diego, Cal.	nw.	200	2,839	3.9	n. 47 w.	285	5.6	n. 34 w.	1,589	+ 13	0.560

TABLE IX.—Resultant winds from observations at 8 a. m. and 8 p. m., daily, during November, 1894.

Number.	Station.	Component direction from—				Resultant.		Number.	Station.	Component direction from—				Resultant.													
		N.	S.	E.	W.	Direction from—	Duration.			N.	S.	E.	W.	Direction from—	Duration.												
New England.														Upper Lake Region—Cont'd.													
1	Eastport, Me.	19	15	6	33	n. 82 w.	27	71	Chicago, Ill.	19	19	12	27	w. . . .	15												
2	Portland, Me.	18	18	6	34	w. . . .	28	72	Milwaukee, Wis.	16	20	6	30	s. 81 w.	24												
3	Northfield, Vt.	20	30	3	13	n. 45 w.	14	73	Green Bay, Wis.	16	23	7	26	s. 70 w.	20												
4	Boston, Mass.	15	13	5	30	n. 87 w.	31	74	Duluth, Minn.	21	19	6	29	n. 85 w.	23												
North Dakota.																											
5	Nantucket, Mass.	30	11	12	18	n. 18 w.	20																				
6	Woods Hole, Mass.	11	6	7	14	n. 54 w.	9	75	Moorhead, Minn.	26	23	5	17	n. 76 w.	12												
7	Block Island, R. I.	25	9	9	32	n. 55 w.	28	76	Saint Vincent, Minn.	23	24	10	14	s. 76 w.	4												
8	New Haven, Conn.	30	8	5	25	n. 42 w.	30	77	Bismarck, N. Dak.	26	17	11	22	n. 51 w.	14												
9	New London, Conn.	21	11	3	35	n. 73 w.	34	78	Williston, N. Dak.	15	20	10	29	s. 75 w.	20												
Middle Atlantic States.														Upper Mississippi Valley.													
10	Albany, N. Y.	18	25	6	20	s. 63 w.	16	79	Saint Paul, Minn.	15	19	18	25	s. 60 w.	8												
11	New York, N. Y.	18	17	6	31	n. 88 w.	25	80	La Crosse, Wis.	24	24	4	17	w. . . .	13												
12	Harrisburg, Pa.	8	13	17	27	s. 63 w.	11	81	Davenport, Iowa.	17	18	11	29	s. 87 w.	18												
13	Philadelphia, Pa.	19	15	10	27	n. 77 w.	18	82	Des Moines, Iowa.	24	17	9	24	n. 65 w.	17												
14	Atlantic City, N. J.	23	13	4	32	n. 79 w.	30	83	Keokuk, Iowa.	20	18	10	31	n. 85 w.	21												
15	Baltimore, Md.	15	18	10	30	s. 81 w.	20	84	Cairo, Ill.	22	23	8	15	s. 7 w.	1												
16	Washington, D. C.	18	23	7	21	s. 70 w.	15	86	Springfield, Ill.	18	23	6	25	s. 75 w.	20												
17	Lynchburg, Va.	19	20	9	32	s. 88 w.	23	87	Hannibal, Mo.	16	15	7	31	n. 88 w.	24												
18	Norfolk, Va.	20	19	9	22	n. 86 w.	13	88	Saint Louis, Mo.	15	22	12	25	s. 62 w.	15												
South Atlantic States.														Missouri Valley.													
19	Charlotte, N. C.	15	26	15	26	s. 70 w.	12	89	Columbia, Mo.	9	9	8	14	w. . . .	6												
20	Hatteras, N. C.	27	15	7	25	n. 56 w.	22	90	Kansas City, Mo.	22	22	14	20	w. . . .	6												
21	Kittyhawk, N. C.	23	17	12	28	n. 69 w.	17	91	Springfield, Mo.	20	26	12	18	s. 45 w.	8												
22	Raleigh, N. C.	31	22	8	26	s. 87 w.	18	92	Omaha, Nebr.	22	18	12	23	n. 70 w.	12												
23	Wilmington, N. C.	24	16	9	26	n. 65 w.	19	93	Valentine, Nebr.	22	12	4	32	n. 70 w.	30												
24	Charleston, S. C.	25	16	11	23	n. 53 w.	15	94	Sioux City, Iowa.	27	21	7	13	n. 45 w.	8												
25	Augusta, Ga.	20	14	17	21	n. 34 w.	7	95	Pierre, S. Dak.	22	16	19	23	n. 34 w.	7												
26	Savannah, Ga.	23	16	10	28	n. 69 w.	19	96	Huron, S. Dak.	20	22	12	23	s. 80 w.	11												
27	Jacksonville, Fla.	31	14	13	15	n. 7 w.	17	Northern Slope.																			
Florida Peninsula.														98	Havre, Mont.	16	10	10	35	n. 77 w.	26						
29	Jupiter, Fla.	23	13	25	10	n. 56 e.	18	99	Miles City, Mont.	15	23	11	23	s. 56 w.	14												
30	Key West, Fla.	26	8	40	3	n. 65 e.	42	100	Helena, Mont.	10	24	1	42	s. 71 w.	43												
31	Tampa, Fla.	36	5	18	12	n. 11 e.	32	101	Rapid City, S. Dak.	11	12	8	38	s. 88 w.	30												
32	Titusville, Fla.	26	7	20	20	n. . . .	19	102	Cheyenne, Wyo.	22	8	4	38	n. 68 w.	37												
Eastern Gulf States.														103	Lander, Wyo.	9	29	10	29	s. 44 w.	28						
33	Atlanta, Ga.	30	13	17	26	n. 52 w.	11	105	North Platte, Nebr.	15	20	6	33	n. 80 w.	28												
34	Pensacola, Fla.	29	12	22	11	n. 33 e.	20	Middle Slope.																			
35	Mobile, Ala.	29	14	13	18	n. 18 w.	16	107	Denver, Colo.	14	26	13	21	s. 34 w.	14												
36	Montgomery, Ala.	26	16	20	17	n. 23 e.	8	109	Pueblo, Colo.	25	11	18	31	n. 41 w.	20												
37	Meridian, Miss.	26	18	16	14	n. 14 e.	8	110	Concordia, Kans.	23	21	10	16	n. 72 w.	6												
38	Vicksburg, Miss.	20	23	28	7	s. 82 e.	21	111	Dodge City, Kans.	28	16	11	14	n. 14 w.	12												
39	New Orleans, La.	27	14	29	6	n. 61 e.	26	112	Wichita, Kans.	24	23	10	12	n. 63 w.	2												
Western Gulf States.														113	Oklahoma, Okla.	23	27	9	13	s. 45 w.	6						
40	Shreveport, La.	14	28	18	12	s. 23 e.	15	Southern Slope.																			
41	Fort Smith, Ark.	17	11	32	8	n. 76 e.	25	114	Abilene, Tex.	16	34	8	14	s. 18 w.	19												
42	Little Rock, Ark.	19	19	11	20	w. . . .	9	115	Amarillo, Tex.	22	29	3	15	s. 60 w.	14												
43	Corpus Christi, Tex.	24	16	29	4	n. 62 e.	17	Southern Plateau.																			
44	Galveston, Tex.	20	20	30	3	e. . . .	27	116	El Paso, Tex.	16	10	24	23	n. 9 e.	6												
45	Palestine, Tex.	17	25	11	17	s. 37 w.	10	117	Santa Fe, N. Mex.	18	24	32	7	s. 77 e.	26												
46	San Antonio, Tex.	20	15	35	3	n. 81 e.	32	118	Tucson, Ariz.	11	28	20	16	s. 13 e.	18												
Ohio Valley and Tennessee.														119	Yuma, Ariz.	39	4	23	7	n. 25 e.	38						
47	Chattanooga, Tenn.	11	22	14	24	s. 42 w.	15	120	Carson City, Nev.	29	11	13	20	n. 21 w.	19												
48	Knoxville, Tenn.	23	13	11	26	n. 56 w.	18	Middle Plateau.																			
49	Memphis, Tenn.	20	24	14	19	s. 51 w.	6	121	Winnemucca, Nev.	14	14	32	14	e. . . .	18												
50	Nashville, Tenn.	20	23	7	22	s. 79 w.	15	122	Salt Lake City, Utah.	17	20	22	20	s. 34 e.	4												
51	Lexington, Ky.	10	29	6	23	s. 42 w.	20	Northern Plateau.																			
52	Louisville, Ky.	8	27	11	22	s. 30 w.	22	123	Baker City, Oreg.	8	34	24	11	s. 27 e.	29												
53	Indianapolis, Ind.	15	25	10	26	s. 58 w.	19	124	Idaho Falls, Idaho.	10	33	6	24	s. 38 w.	29												
54	Cincinnati, Ohio.	10	25	17	24	s. 25 w.	17	125	Spokane, Wash.	16	27	14	17	s. 15 w.	11												
55	Columbus, Ohio.	11	22	12	26	s. 52 w.	18	126	Walla Walla, Wash.	8	38	9	17	s. 15 w.	31												
56	Pittsburg, Pa.	9	25	6	34	s. 60 w.	32	North Pacific Coast Region.																			
57	Parkersburg, W. Va.	3	27	20	20	s. . . .	24	127	Fort Canby, Wash.	14	20	19	17	s. 18 e.	6												
Lower Lake Region.														129	Port Angeles, Wash.	5	28	19	18	s. 2 e.	23						
58	Buffalo, N. Y.	19	18	11	29	n. 87 w.	18	130	Seattle, Wash.	10	20	27	9	s. 77 e.	18												
59	Oswego, N. Y.	19	23	12	23	s. 70 w.	12	131	Tatoosh Island, Wash.	2	17	33	16	s. 48 e.	23												
60	Rochester, N. Y.	15	24	11	27	s. 61 w.	18	132	Portland, Oreg.	16	28	10	23	s. 47 w.	18												
61	Erie, Pa.	13	27	4	27	s. 59 w.	27	133	Roseburg, Oreg.	16	16	10	23	w. . . .	13												
62	Cleveland, Ohio.	10	29	15	24	s. 25 w.	21	Middle Pacific Coast Region.																			
63	Sandusky, Ohio.	18	22	5	30	s. 79 w.	26	134	Eureka, Cal.	19	15	14	25	n. 70 w.	12												
64	Toledo, Ohio.	18	17	5	33	n. 88 w.	28	135	Red Bluff, Cal.	47	9	6	27	n. 29 w.	43												
65	Detroit, Mich.	18	17	9	39	n. 88 w.	27	136	Sacramento, Cal.	37	11	11	14	n. 7 w.	20												
Upper Lake Region.														137	San Francisco, Cal.	11	22	6	38	s. 71 w.	34						
66	Alpena, Mich.	19	14	5	32	n. 80 w.	28	South Pacific Coast Region.																			
67	Grand Haven, Mich.	23	17	18	21	n. 27 w.	7	138	Fresno, Cal.	14	12	18	25	n. 74 w.	7												
68	Marquette, Mich.	19	20	8	26	s. 87 w.	18	139	Los Angeles, Cal.	23	4	13	24	n. 30 w.	22												
69	Port Huron, Mich.	15	23	7	30	s. 71 w.	24	140	San Diego, Cal.	30	10	9	25	n. 39 w.	26												
70	Sault Ste. Marie, Mich.	17	18	18	20	s. 63 w.	2	141	San Luis Obispo, Cal.	27	17	19	14	n. 27 e.	11												

* Keeler discontinued and Carson City opened.

TABLE Xa.—Temperature data for selected voluntary stations, Nov., 1894.

State and station.	Normal for month.	Length of record.	Mean, Nov., 1894.	Departure from the normal.	Extreme monthly means.			
					Highest.	Year.	Lowest.	Year.
Arizona.	°	Years	°	°	°		°	
Fort Apache	43.4	23	48.2	+ 4.8	48.2	1894	38.5	1880
Whipple Barracks	43.5	22	49.6	+ 6.1	49.6	1894	36.1	1886
Arkansas.								
Keesees Ferry	47.1	12	47.5	+ 0.4	51.2	1890	44.1	1889
California.								
Riverside	57.4	12	61.6	+ 4.2	61.6	1894	53.7	1893
Colorado.								
Las Animas	37.2	11	44.8	+ 7.6	44.8	1894	29.4	1889
Florida.								
Merritts Island	67.9	12	68.5	+ 0.6	73.3	1883	60.0	1885
Georgia.								
Forsyth	56.7	19	54.8	- 1.9	61.7	1874, 1890	51.0	1880
Idaho.								
Boise Barracks	38.8	20	43.2	+ 4.4	45.8	1885	31.5	1880
Fort Sherman	36.0	10	42.4	+ 6.4	42.6	1890	25.4	1886
Indiana.								
Lafayette	39.5	11	37.1	- 2.4	44.6	1890	36.6	1892
Iowa.								
Cresco	28.7	22	27.5	- 1.2	34.7	1878	19.2	1880
Kansas.								
Eureka Ranch	39.5	11	40.0	+ 0.5	44.7	1885	30.3	1887
Independence	43.8	22	45.4	+ 1.6	50.7	1878	33.6	1880
Salina	41.8	11	.....	.....	44.5	1887	39.6	1891
Louisiana.								
Grand Coteau	59.4	12	58.8	- 0.6	64.0	1883	56.2	1889
Maine.								
Orono	34.0	24	29.8	- 4.2	38.6	1889	27.1	1875
Maryland.								
Cumberland	40.0	23	38.6	- 1.4	44.7	1883	35.0	1880
Michigan.								
Kalamazoo	37.1	18	34.5	- 2.6	43.4	1890	27.0	1880
Missouri.								
Sedalia	43.1	11	41.8	- 1.3	46.7	1887	38.5	1891
Montana.								
Fort Custer	33.1	15	.....	.....	39.9	1890	24.5	1880
Nebraska.								
Fort Robinson	35.9	10	39.4	+ 3.5	40.7	1885	31.8	1886
Genoa (near)	33.7	18	35.0	+ 1.3	39.8	1890	22.6	1880
Nevada.								
Carson City	37.8	17	43.6	+ 5.8	43.6	1894	31.4	1881
New Hampshire.								
Hanover	34.1	23	31.9	- 2.2	37.1	1877	24.8	1873
New Mexico.								
Fort Wingate	39.6	22	46.0	+ 6.4	46.0	1894	31.4	1880
New York.								
Cooperstown	34.9	23	31.9	- 3.0	38.5	1876, 1877	26.6	1873
Plattsburg Barracks	34.4	23	33.7	- 1.7	39.0	1889	25.3	1873
North Carolina.								
Lenoir	45.1	22	44.2	- 0.9	49.8	1890	39.9	1872
Oklahoma.								
Fort Reno	47.7	11	48.0	+ 0.3	51.5	1885	42.7	1889
Fort Sill	47.7	22	48.8	+ 1.1	52.9	1879	36.6	1880
Fort Supply	44.0	13	45.2	+ 1.2	48.8	1885	39.2	1889
Oregon.								
Bandon	49.3	10	49.6	+ 0.3	52.0	1891	43.0	1886
Pennsylvania.								
Dyberry	34.7	21	33.4	- 1.3	38.3	1883	24.9	1878
Grampian	35.2	23	33.8	- 1.4	39.2	1890	29.3	1872
Wellsboro	37.7	15	32.0	- 5.7	41.4	1885	32.0	1894
South Carolina.								
Statesburg	53.5	13	52.1	- 1.4	58.2	1890	51.2	1891
South Dakota.								
Fort Sully	30.6	23	.....	.....	39.2	1878	21.1	1880
Texas.								
Austin	57.6	22	59.7	+ 2.1	63.2	1883	46.0	1880
Silver Falls	49.5	8	51.6	+ 2.1	52.4	1890	45.3	1889
Utah.								
Terrace	35.9	22	39.0	+ 3.1	46.0	1885	24.1	1880
Vermont.								
Strafford	33.4	21	29.5	- 3.9	37.9	1886	23.4	1873
Virginia.								
Dale Enterprise	45.7	14	40.1	- 5.6	49.6	1888	39.7	1893
Washington.								
Fort Townsend	43.0	19	44.9	+ 1.9	47.3	1884	39.2	1880
Wisconsin.								
Madison	33.2	16	30.4	- 2.8	38.4	1890	27.3	1873
Wyoming.								
Fort Washakie	27.3	10	37.0	+ 9.7	37.0	1894	10.1	1880

TABLE Xb.—Precipitation data for selected voluntary stations, Nov., 1894.

State and station.	Normal for month.	Length of record.	Total, Nov., 1894.	Departure from the normal.	Extremes.			
					Greatest.		Least.	
					Amt.	Year.	Amt.	Year.
Arizona.	Inches.	Years	Inches.	Inches.	Inches.		Inches.	
Fort Apache	1.13	18	0.00	- 1.13	2.83	1890	0.00	1891, 1894
Whipple Barracks	0.80	22	0.00	- 0.80	3.18	1888	0.00	*
Arkansas.								
Keesees Ferry	4.15	13	1.31	- 2.84	8.85	1891	1.31	1894
California.								
Riverside	0.67	14	0.00	- 0.67	2.47	1888	0.00	*
Colorado.								
Las Animas	0.20	13	T.	- 0.20	0.70	1885	0.00	1890, 1891
Florida.								
Merritts Island	2.24	16	5.58	+ 3.34	5.67	1884	0.17	1886
Georgia.								
Forsyth	3.34	20	0.96	- 2.38	5.41	1888	0.50	1890
Idaho.								
Boise Barracks	1.19	21	0.35	- 0.84	4.43	1874	0.00	1890
Fort Sherman	3.15	11	2.58	- 0.57	7.00	1892, 1893	0.29	1882
Indiana.								
Lafayette	3.19	12	2.28	- 0.91	6.31	1891	1.44	1884
Iowa.								
Cresco	1.43	23	0.90	- 0.53	5.20	1879	0.18	1875
Kansas.								
Eureka Ranch	0.55	11	0.02	- 0.53	1.75	1889	0.00	1883
Independence	1.87	22	0.98	- 0.89	3.90	1876	0.06	1872
Salina	0.67	11	.....	.....	2.55	1889	T.	1887
Louisiana.								
Grand Coteau	3.67	11	1.73	- 1.94	6.42	1893	1.51	1890
Maine.								
Orono	4.44	24	1.24	- 3.20	8.76	1886	1.34	1894
Maryland.								
Cumberland	2.33	23	0.63	- 1.70	5.34	1889	0.63	1894
Michigan.								
Kalamazoo	2.55	18	2.40	- 0.18	5.77	1877	1.25	1882
Missouri.								
Sedalia	2.03	16	1.39	- 0.74	3.17	1881	0.53	1885
Montana.								
Fort Custer	0.60	15	1.45	+ 0.85	1.68	1891, 1893	0.05	1887
Nebraska.								
Fort Robinson	0.49	11	0.39	- 0.10	1.70	1885	0.07	1892
Genoa (near)	0.70	18	0.10	- 0.60	1.43	1886	T.	1883
Nevada.								
Carson City	1.62	17	0.22	- 1.40	7.01	1875	0.00	1884
New Hampshire.								
Hanover	3.54	23	2.46	- 1.08	6.62	1885	0.59	1882
New Mexico.								
Fort Wingate	0.67	20	0.00	- 0.67	2.12	1878	0.00	*
New York.								
Cooperstown	3.04	23	2.72	- 0.32	4.72	1886	1.45	1876
Plattsburg Barracks	2.33	23	2.82	+ 0.49	4.39	1885	0.54	1882
North Carolina.								
Lenoir	3.34	22	0.64	- 2.70	7.60	1877	0.00	1890
Oklahoma.								
Fort Reno	0.97	11	0.00	- 0.97	3.38	1884	0.00	*
Fort Sill	1.43	22	0.00	- 1.43	4.06	1890	0.00	1894
Fort Supply	0.99	14	0.25	- 0.74	3.30	1874	0.10	1886
Oregon.								
Bandon	6.65	16	7.55	+ 0.90	18.21	1885	0.33	1890
Pennsylvania.								
Dyberry	3.16	23	2.21	- 0.95	7.00	1886	1.40	1882
Grampian	2.96	18	3.04	+ 0.08	6.03	1886	1.42	1872
Wellsboro	4.19	15	3.06	- 1.13	9.07	1889	0.93	1890
South Carolina.								
Statesburg	1.88	13	1.03	- 0.86	3.90	1882	0.87	1886
South Dakota.								
Fort Sully	0.43	23	.....	.....	1.60	1886	0.00	1883
Texas.								
Austin	3.07	22	0.00	- 3.07	7.53	1874	0.00	1894
Silver Falls	1.01	8	0.00	- 1.01	4.68	1888	0.00	1894
Utah.								
Terrace	0.38	20	0.00	- 0.38	1.83	1874	0.00	*
Vermont.								
Strafford	3.35	21	3.42	+ 0.07	6.20	1888	0.50	1874
Virginia.								
Dale Enterprise	2.61	14	0.58	- 2.03	6.46	1886	0.53	1882
Washington.								
Fort Townsend	2.96	19	3.29	+ 0.33	9.21	1874	0.39	1884
Wisconsin.								
Madison	2.01	22	1.63	- 0.38	6.02	1879	0.40	1875
Wyoming.								
Fort Washakie	0.64	10	0.22	- 0.42	1.40	1893	0.06	1890

* Frequently.

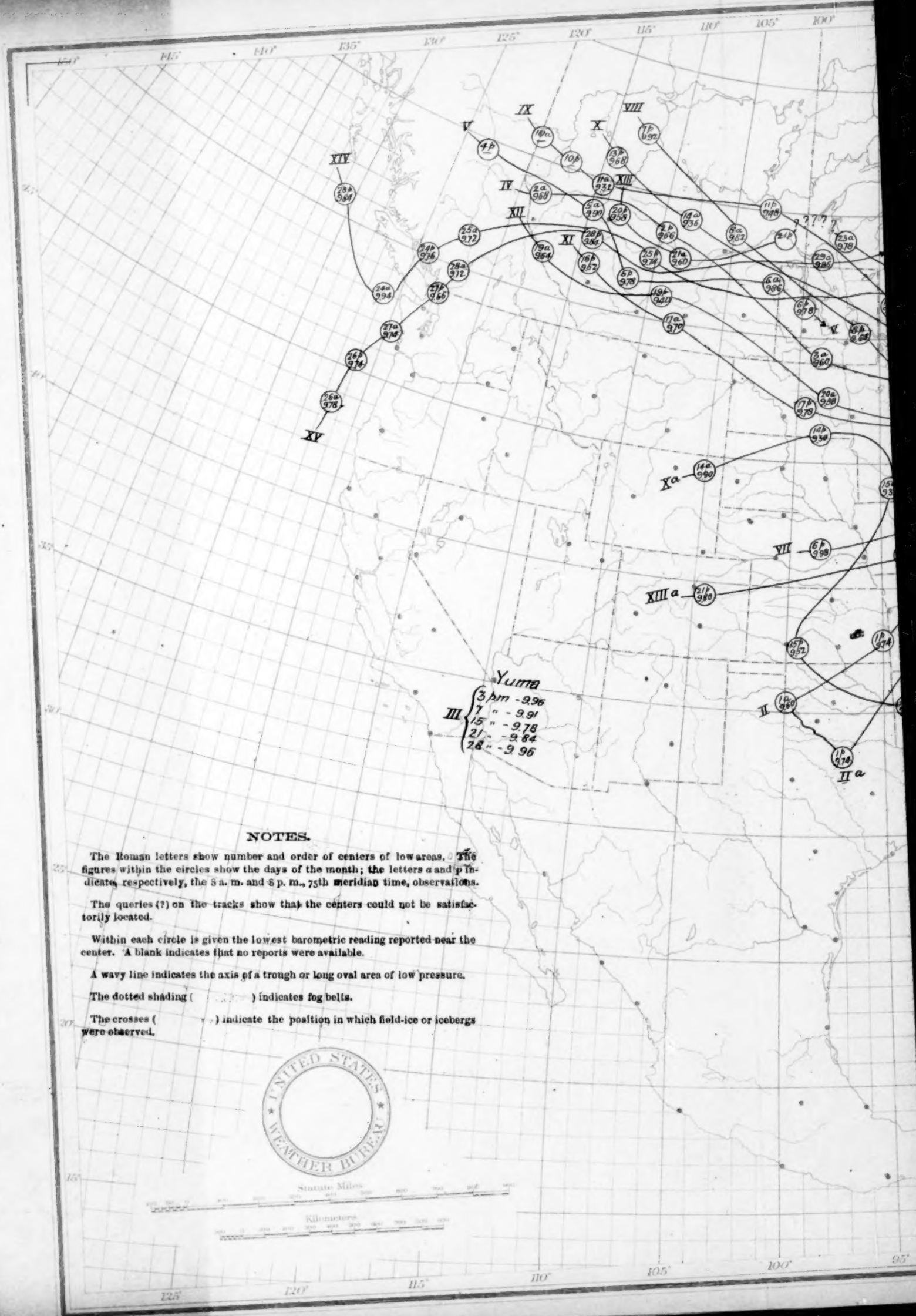
TABLE XI.—Thunderstorms and auroras, November, 1894.

States.	No. of stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.		
Alabama.....	48	T.															4							7									11	T.	
Arizona.....	45	A.																															0	A.	
Arkansas.....	45	T.	6	1																			1	2							1		11	T.	
Colorado.....	76	A.																															0	A.	
California.....	314	T.																															0	T.	
Connecticut.....	22	A.			1		4	1																									6	T.	
Delaware.....	7	T.																															0	T.	
District of Columbia...	4	A.																															0	A.	
Florida.....	37	T.	3	5					1									3															12	T.	
Georgia.....	58	A.		1																				4	2								7	T.	
Idaho.....	26	T.		1																													1	T.	
Illinois.....	57	A.																					2								7		9	A.	
Indiana.....	40	T.																															0	T.	
Indian Territory.....	6	A.	1																														1	T.	
Iowa.....	81	T.	2	1																													3	A.	
Kansas.....	72	A.	4															1	1	1											1	2	7	T.	
Kentucky.....	40	T.																1					2										3	A.	
Louisiana.....	48	A.	6	5										1			1	1	1				1	5									21	T.	
Maine.....	17	T.	1															1	1	1													4	T.	
Maryland.....	37	A.																					4										3	A.	
Massachusetts.....	84	T.		1																													2	T.	
Michigan.....	79	A.																															1	T.	
Minnesota.....	64	T.																															0	A.	
Mississippi.....	50	A.	1	2														4	1	1				3									15	T.	
Missouri.....	96	T.	10	2									1	1									2								3	12	31	T.	
Montana.....	25	A.																																0	A.
Nebraska.....	121	T.																																4	T.
Nevada.....	49	A.																																1	T.
New Hampshire.....	25	T.																																0	A.
New Jersey.....	55	A.								2	3																							3	T.
New Mexico.....	31	T.																																0	A.
New York.....	88	A.																																0	T.
North Carolina.....	55	T.		1																														3	A.
North Dakota.....	34	A.																																0	T.
Ohio.....	143	T.	1	1																														18	T.
Oklahoma.....	16	A.																																2	A.
Oregon.....	49	T.																																1	T.
Pennsylvania.....	86	A.																																0	A.
Rhode Island.....	9	T.																																1	T.
South Carolina.....	43	A.		1																														18	T.
South Dakota.....	37	T.																																0	A.
Tennessee.....	41	A.																																8	T.
Texas.....	79	T.	6	2																														14	A.
Utah.....	32	A.																																15	T.
Vermont.....	15	T.																																0	A.
Virginia.....	35	A.																																2	T.
Washington.....	49	T.																																1	T.
West Virginia.....	37	A.		1																														1	A.
Wisconsin.....	64	T.																																1	T.
Wyoming.....	11	A.																																9	A.
Sums.....	2,682	T.	39	30	3	3	6	2	1	1	4	6	0	2	1	0	1	13	10	4	1	1	0	4	49	10	0	0	1	1	5	23	213	T.	
		A.	2	4	1	1	2	0	0	0	0	0	1	0	8	0	1	8	7	7	2	2	0	1	4	8	1	2	1	4	4	2	74	A.	

TABLE XII. — Climatological data from the monthly reports of the State Weather Services, November, 1894.

State.	Temperature.				Monthly ranges.				Precipitation.				Director.		
	Mean departure.	Maximum.	Date.	Station.	Minimum.	Date.	Station.	Station.		Station.		Amount.			
								Greatest.	Least.	Amount.	Station.			Amount.	Station.
Alabama.....	-1.3	85	17	Brewton	Newburg	0	68	Newburg	42	Marion	-3.13	1.49	Newbern	Daphne	F. P. Chaffee.
Alaska.....															Not yet organized.
Arizona.....	+1.5	95	8	Parker	Flagstaff	13	63	Parker	34	Oracle	-0.85	1	Osark		W. Burrows.
Arkansas.....	+2.0	96	7	Cameron	Pocahontas	12	63	Pocahontas	27	Mount Nebo	-1.98	3.28	Osark		F. H. Clarke.
California.....				Palm Springs	Boca	5	70	Winchester	27	Point Lobos	-1.82	5.07	Crescent City	Numerous places	J. A. Barwick.
Colorado.....	+5.2	85	9	Minneapolis	Julesburg	5	79	Julesburg	38	Gold Hill	-0.51	2.50	Breckenridge	Canyon	F. H. Brandenburg.
Connecticut.....	-3.5	67	20	Colchester	Canton	7	59	Colchester	46	Hartford	+0.92	6.96	Wallingford	Canford	J. Warren Smith.
Delaware.....	71		19	Milford	Newark	19	51	Millboro	44	Dover	-0.92	2.90	Wilmington	Milford	C. P. Cronk.
District of Columbia.....	-0.5	88	2	Plant City	Pensacola	29	55	Archer	23	Key West	+0.03	7.61	Federal Point	Manatee	See Maryland.
Florida.....															E. R. Demain.
Georgia.....	-2.0	84	23	Fort Gaines	Clayton	14	50	Fort Gaines	46	Griffin	4.50	0.40	Albany	Lafayette	George E. Hunt.
Idaho.....															D. P. McCallum.
Illinois.....	-1.8	75	15	Griggsville	Carrollton	0	71	Carrollton	41	Mattoon	-1.58	3.46	Carlinville	Albion	John Craig.
Indiana.....	-2.0	70	1	Laconia	Butterville	6	63	Butterville	43	Crawfordsville	-1.79	3.64	Huntington	Evansville	Prof. R. A. Huston.
Indian Territory.....															See Oklahoma.
Iowa.....	-1.4	72	15	Keokuk	Forest City	5	70	Ogden	46	Sac City	-0.84	2.42	Seymour	Rock Rapids	J. R. Sage.
Kansas.....	+1.8	80	17	Lakin	Kiowa	8	85	Kiowa	32	Ness City	-0.86	2.24	Yates Center	McPherson	T. B. Jennings.
Kentucky.....	80		8	Russellville	Harradaburg	12	69	Russellville	34	Callettsburg	-2.26	3.70	Alpha	Richmond	Frank Burks.
Louisiana.....	-0.4	89	21	Cameron	Oxford	23	63	Minden	47	Covington	-2.40	3.70	Calais	Thibodeaux	R. E. Kerham.
Maine.....	-3.4	63	2	Farmington	Farmington	23	70	Farmington	48	Portland	-1.74	3.53	Calais	Orono	J. Warren Smith.
Maryland.....	-2.7	80	2	Denton	Deer Park	2	65	Deer Park	40	Fallston	-1.50	3.34	Sunnyside	Bootherville	C. P. Cronk.
Massachusetts.....	-3.6	69	1	Worcester	Lake Cochituate	1	66	Lake Cochituate	41	Provincetown	-0.42	3.21	Taunton	Williamstown	J. Warren Smith.
Michigan.....	-3.9	71	1	Hanover	Sault Ste. Marie	7	69	Harrison	35	Chico	-1.26	5.11	Sault Ste. Marie	Arbela	E. A. Evans.
Minnesota.....	-1.8	83	23	Belle Plaine	St. Vincent	25	72	Marfield	49	Lawrence	-0.20	3.54	Marfield	Bingham Lake	E. A. Beals.
Mississippi.....	-0.7	88	11	Stonington	French Camps	11	70	Rosedale	40	Bay St. Louis	-3.68	2.81	Jackson	Leakeville	R. J. Hyatt.
Missouri.....	-0.6	80	3	Potosi	Elmira	3	74	Unionville	50	Ironton	-1.09	5.40	Linn Creek	Pickering	A. E. Hackett.
Montana.....	-0.6	73	12	Utica	Kipp	18	86	Kipp	39	Columbia Falls	+0.02	3.01	Troy	Beatrice	Prof. M. G. Crawford.
Nebraska.....	+3.3	88	16	Salmon	Fort Robinson	0	85	Chadron	46	Callaway	-0.56	0.75	Hay Springs	Bellevue	Prof. G. D. Swezey.
Nevada.....	-3.1	83	8	Gold Hill	Haleck	12	80	Elko	42	Virginia City	-0.83	0.60	Edgewood	Wellford	Prof. C. W. Friend.
New Hampshire.....	-3.1	63	3	Keene	West Milan	12	69	West Milan	51	Hanover	-0.87	3.85	West Milan	Wolfboro	J. Warren Smith.
New Jersey.....	-1.8	76	2	Beverly	Charlotteburg	11	59	Beverly	40	Ocean City	-0.39	5.12	Tenafly	Cape May	E. W. McGann.
New Mexico.....				Eddy	Monero	2	66	Chama	44	Santa Fe	-0.39	0.18	Pecos	Albert	H. B. Hersey.
New York.....	-2.2	71	12	Varysburg	Canton	7	66	Friendship	44	Brooklyn	-0.52	6.05	Brentwood	Mount Morris	Prof. E. A. Fuertes.
North Carolina.....	-1.9	80	4	Auburn	Highlands	6	65	Bakersville	32	Hatteras	-0.52	3.89	Southport	Bryson City	Dr. H. B. Battle.
North Dakota.....	-3.1	71	13	Fort Berthold	Woodbridge	25	81	Churchville Ferry	63	Berlin	-0.11	0.85	Williston	Dickinson	B. H. Bonham.
Ohio.....	-2.8	79	9	Upper Sandusky	Green Hill	4	71	New Waterford	43	Akron	-0.82	3.85	Canal Dover	Dupont	L. N. Bonham.
Oklahoma.....	+3.0	89	16	Fort Reno	Clifton	2	79	Fort Reno	50	Ponca	-1.95	1.44	Kemp	Anadarko	J. I. Widmeyer.
Oregon.....	-2.0	74	2	Pittsburg	Saengerstown	6	63	Saengerstown	39	Altoona	-0.83	3.64	Warren	Altoona	W. P. Tatham.
Pennsylvania.....	-2.0	74	3	Pittsburg	Saengerstown	6	63	Saengerstown	39	Altoona	-0.83	3.64	Warren	Altoona	W. P. Tatham.
Rhode Island.....	-2.4	64	3	Block Island	Block Island	11	20	Kingston	44	Block Island	+0.01	4.20	Warren	Providence	J. W. Warren Smith.
South Carolina.....	83		17	Hollands Store	Hollands Store	17	54	Little Mountain	43	Port Royal	-0.41	4.20	Pinopolis	Spartanburg	J. W. Bauer.
South Dakota.....	-1.5	83	14	Gary	Gary	12	64	Oelrichs	55	Millbank	-0.41	4.20	Spearsburg	Bowling	S. W. Glenn.
Tennessee.....	-1.7	80	13	Waynesboro	Franklin	9	66	Franklin	42	Rogersville	-2.56	2.50	Springdale	Dyersburg	J. B. Marbury.
Texas.....	+1.9	84	2	Fort Ringgold	Fort Hancock	11	73	Wichita Falls	36	Galveston	-1.97	3.30	Orange	Amarillo	D. D. Bryan.
Utah.....				St. George	Soldiers Summit	2	12	Fillmore	29	Levan	-1.97	3.30	Coalville	Blue Creek	J. H. Smith.
Vermont.....	-4.5	63	3	Brattleboro	Iraaburg	6	74	Iraaburg	43	Jacksonville	-0.17	3.68	Iraaburg	Burlington	J. W. Warren Smith.
Virginia.....				Ashland	Hot Springs	9	59	Ashland	44	Norfolk	-0.17	3.68	Ashland	Graham's Forge	Dr. E. A. Craighill.
Washington.....	-0.4	71	26	Kennecott	Fort Spokane	10	52	Moxee Valley	20	Tatoosh Island	+0.35	16.61	Index	Bridgeport	G. N. Salisbury.
West Virginia.....	82		18	Nuttallburg	Davis	5	74	Marlinton	48	Ellaf	-0.35	3.66	Morgantown	Bridgesport	H. W. Richardson.
Wisconsin.....	-1.1	69	2	City Point	Butternut	15	69	City Point	33	Ashland	+0.35	3.66	Oconto	Oscola Mills	S. C. Emery.
Wyoming.....	+4.0	76	1	Sheridan	Saratoga	16	88	Lander	59	Fort Yellowstone	-0.37	0.98	Sundance	Lodgepole	E. M. Ravenscraft.

* Two or more days. † At other points in the State. ‡ No precipitation reported in State.



NOTES.

The Roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters a and p indicate, respectively, the a. m. and p. m., 75th meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a trough or long oval area of low pressure.

The dotted shading () indicates fog belts.

The crosses () indicate the position in which field-ice or icebergs were observed.



Chart I. Tracks of Centers of Low Areas. November, 1894.

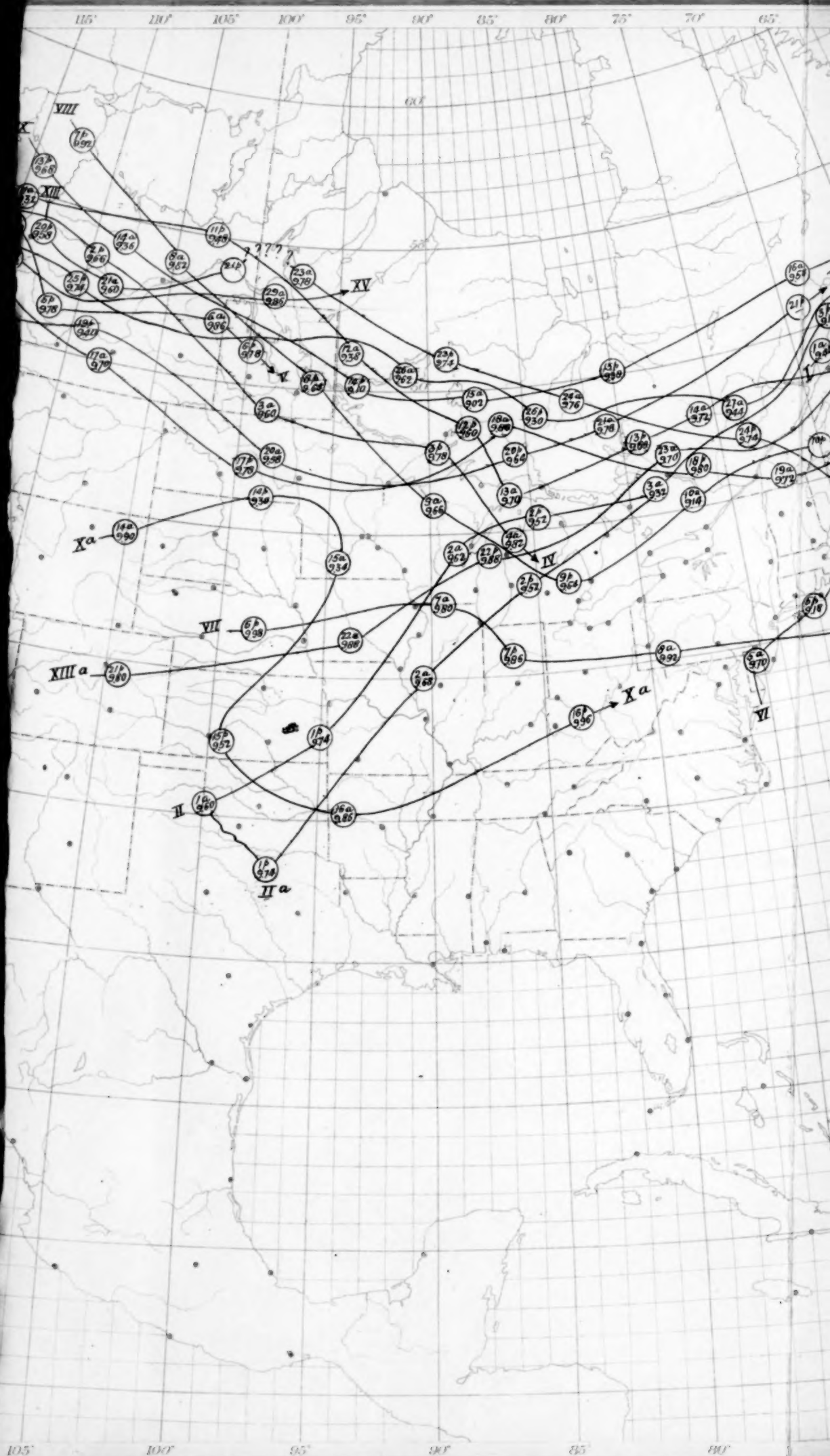
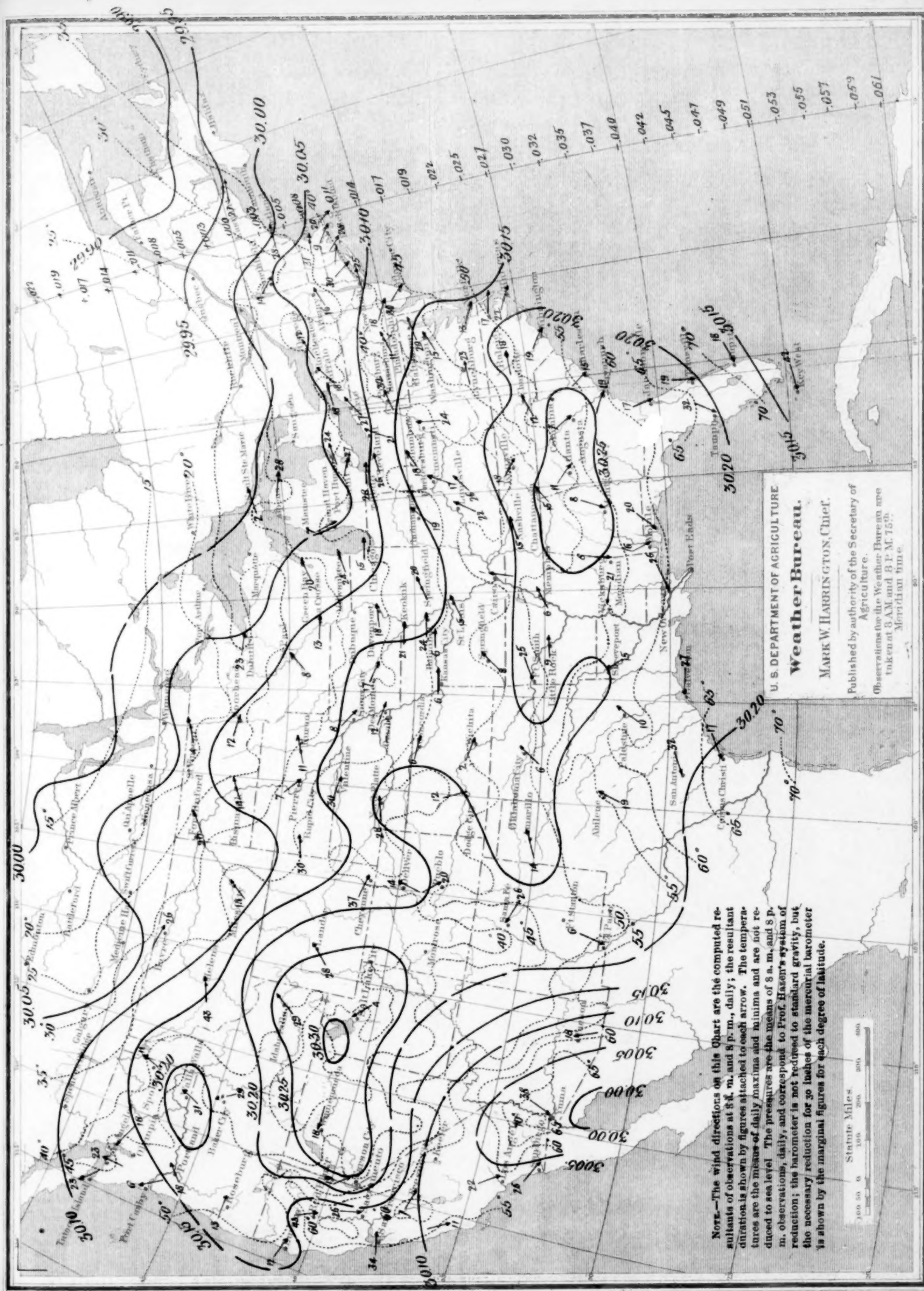




Chart II. Isobars, Isotherms, and Resultant Winds. November, 1894.



NOTE.—The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant direction is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Prof. Hæsen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.

U. S. DEPARTMENT OF AGRICULTURE
Weather Bureau.
 MARK W. HARRINGTON, Chief.

Published by authority of the Secretary of Agriculture.
 Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M. 75th Meridian time.

Chart III. Total Precipitation. November, 1894.

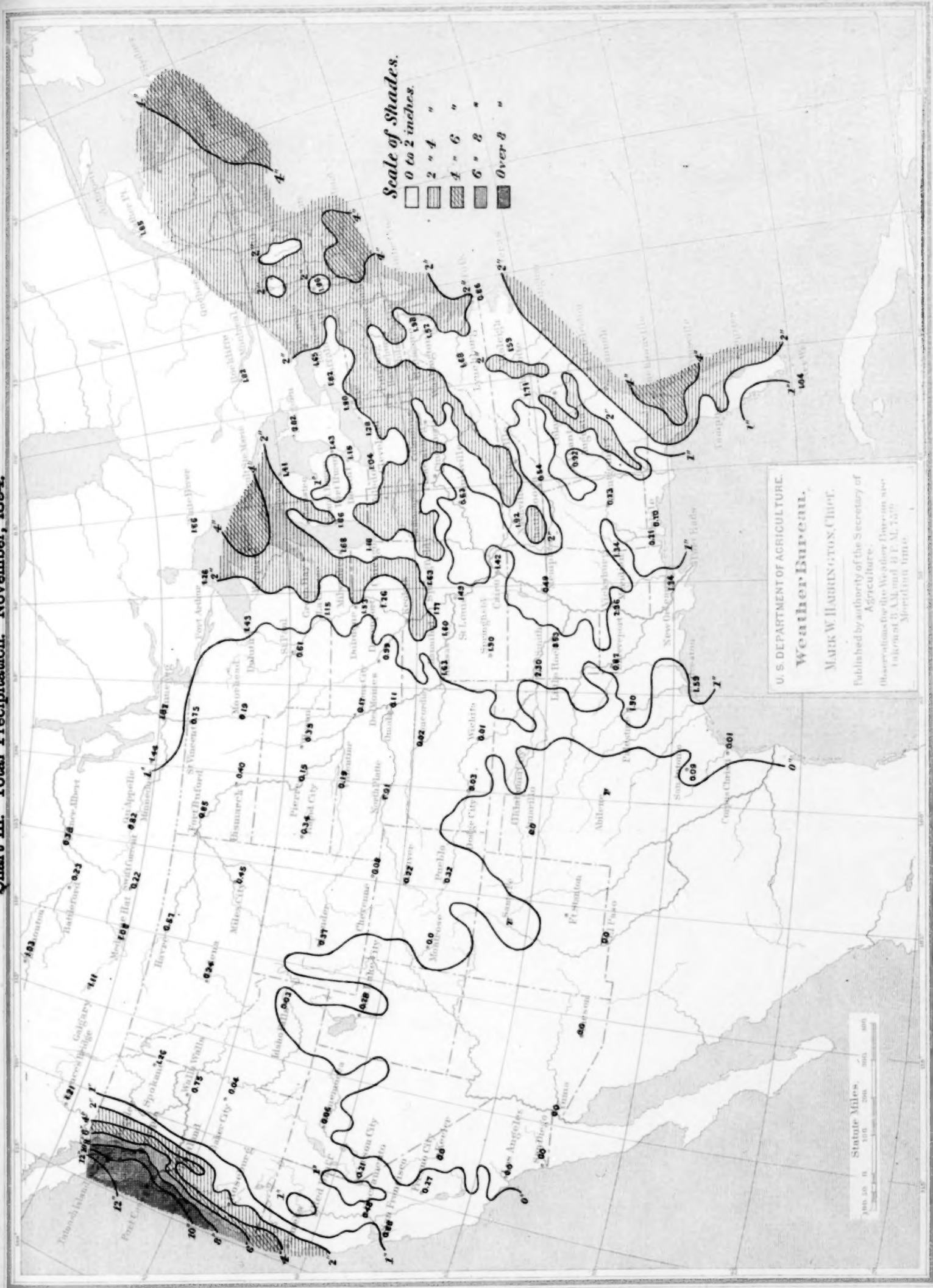
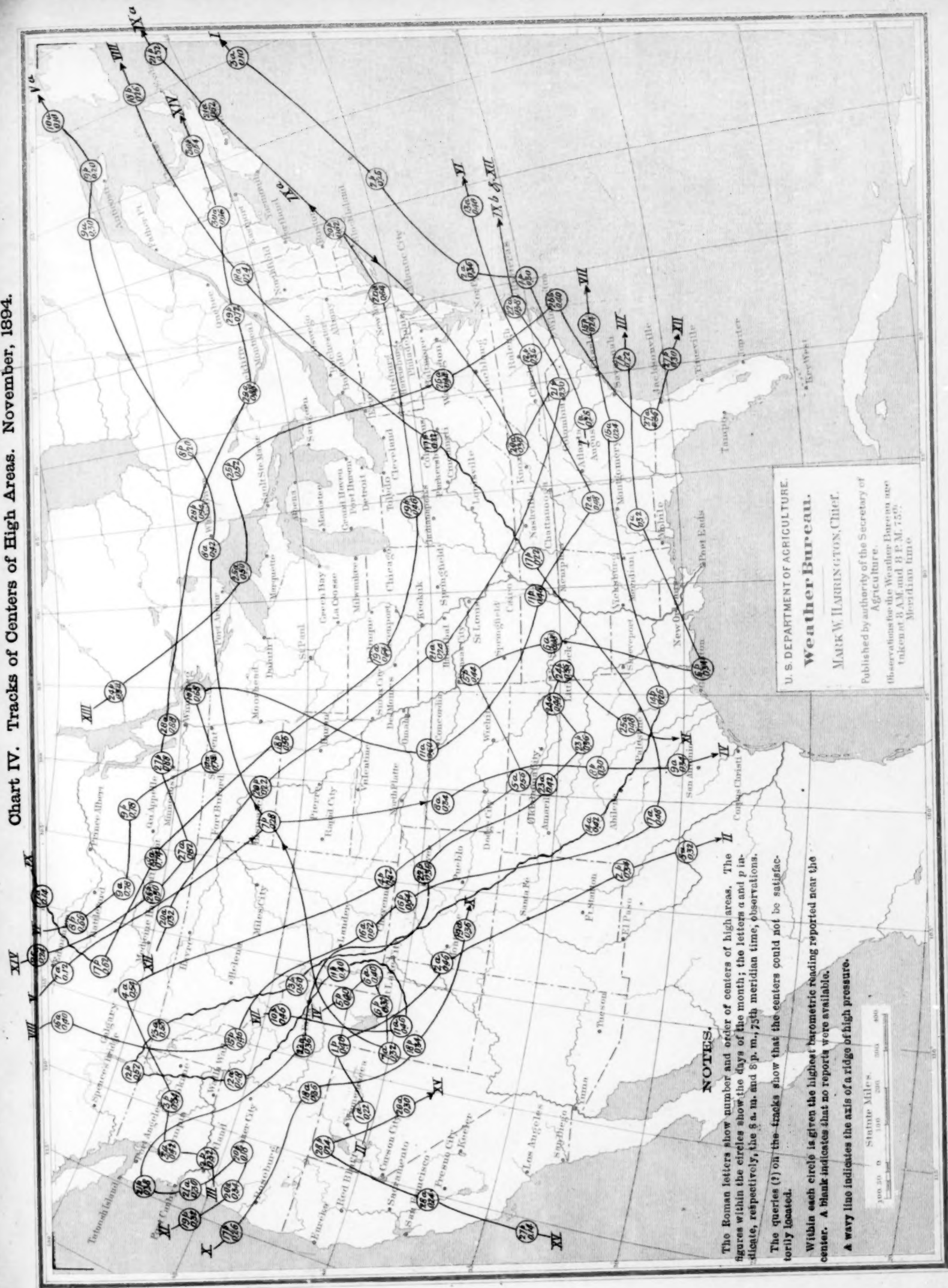




Chart IV. Tracks of Centers of High Areas. November, 1894.



NOTES.

The Roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters a and p indicate, respectively, the a.m. and p.m., 75th meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a ridge of high pressure.

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Chart V. Relative Variations of the Northwest Temperatures and the Horizontal Magnetic Force of Toronto, Washington, and San Antonio.

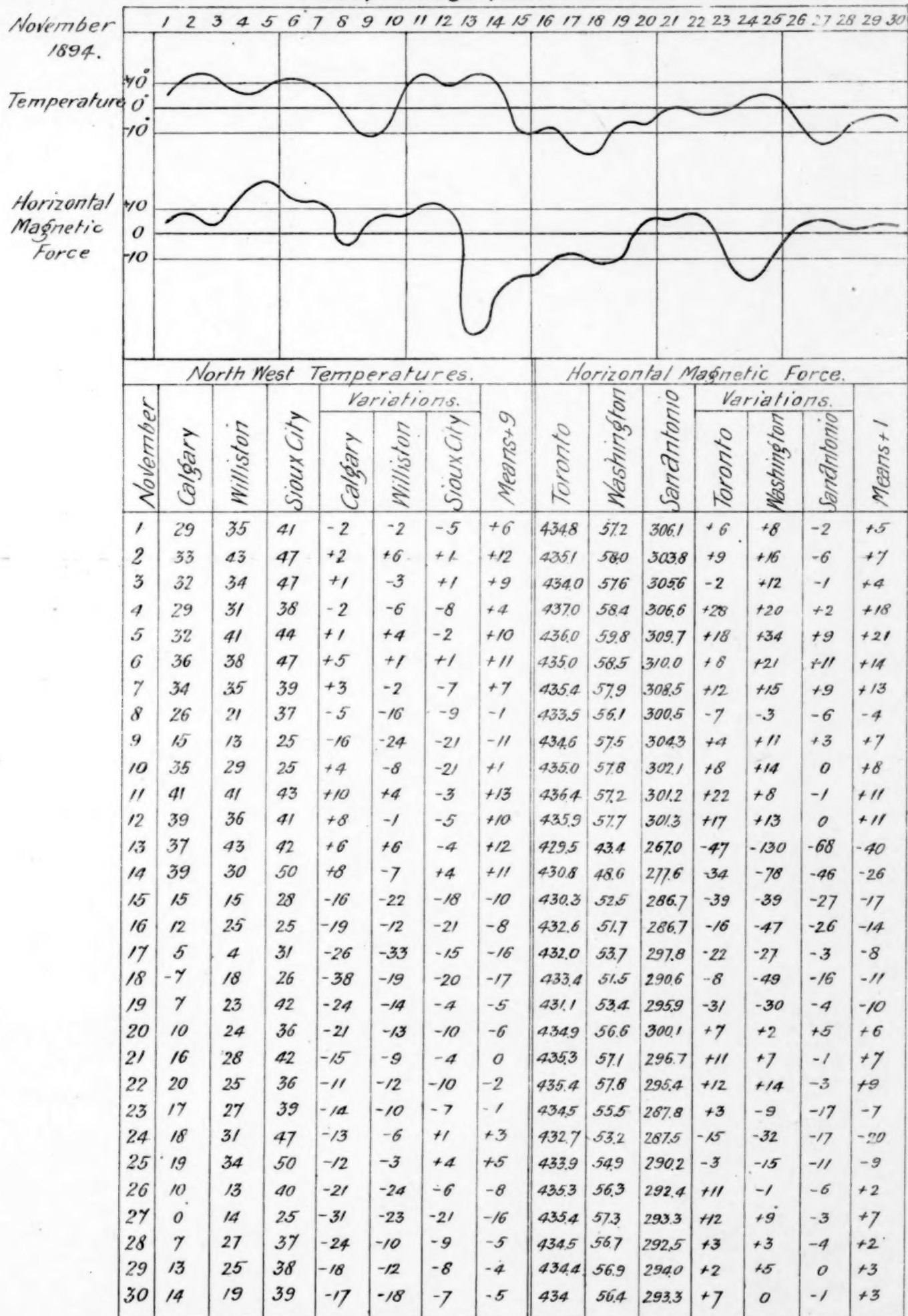


Chart VI. Depth of Snowfall (inches) and Limits of Freezing Weather. November, 1894.

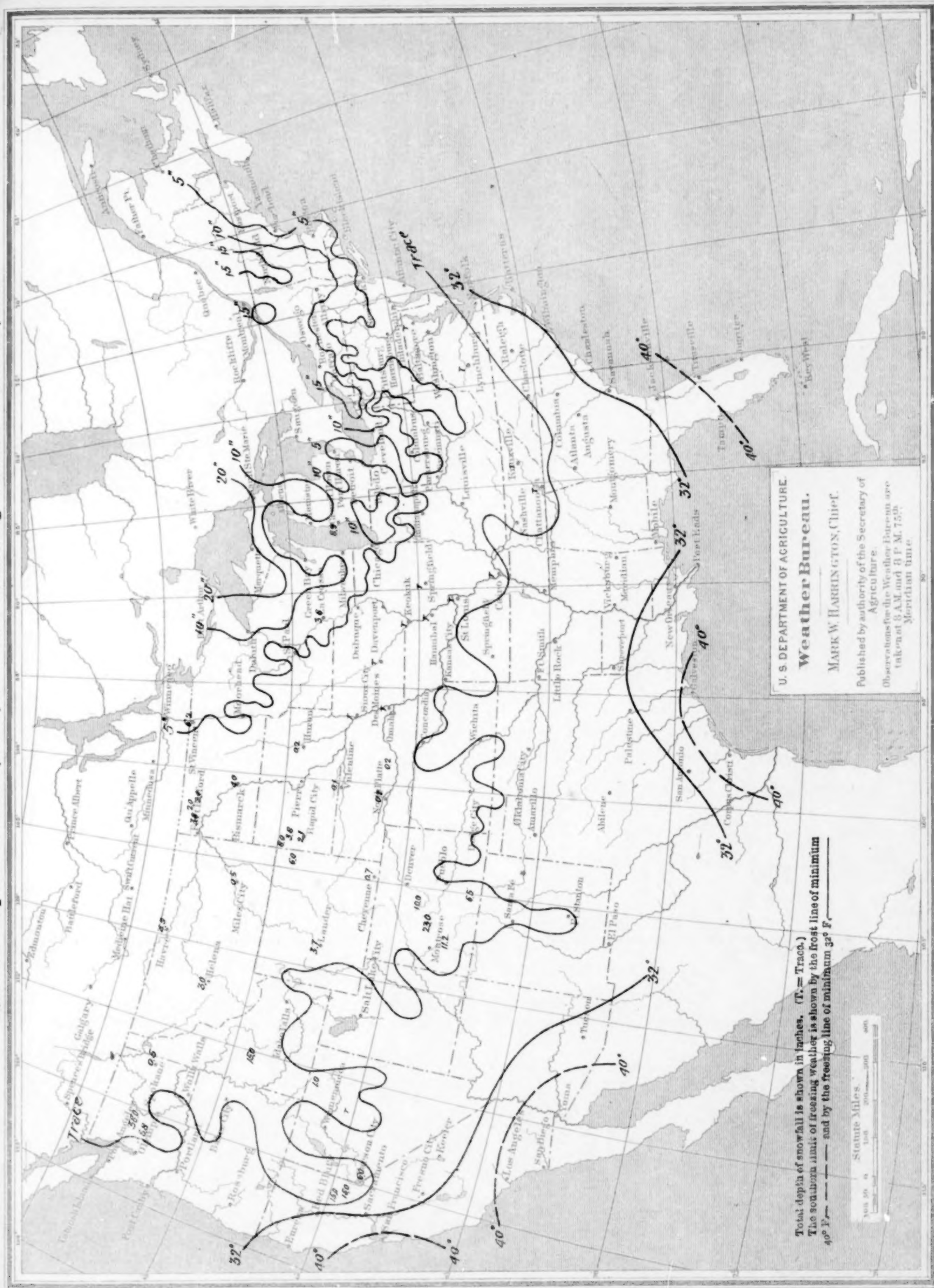


Chart VII. Depth of Snow lying on ground November 30, 1894.

